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LEGAL PROBLEMS OF THE CONQUEST OF THE MOON AND PLANETS

E. G. Vasilevskaya

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16. Abstract

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ANNOTATION

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Editor-in-chief
Doctor of Jurisprudence, Professor
A. S. Piradov

LEGAL PROBLEMS OF THE CONQUEST OF THE MOON AND PLANETS

E. G. Vasilevskaya

Dedicated /3*
to the memory of
the world's first cosmonaut
Yuri Alekseyevich Gagarin

INTRODUCTION

"Since ancient times mankind has dreamed of flying to the stars, of conquering space. Since time immemorial men have fantasized about flying to the Moon and planets of the solar system... Before our very eyes that dream is coming true. The Soviets were the first to half-open the door to the unknown, and then to throw it wide open...[1]. These are the words of the first cosmonaut, a Soviet — Yuri Alekseyevich Gagarin.

Only a little more than ten years has passed since 12 April 1961, when the world learned that man had overcome the force of gravity and for the first time escaped beyond the Earth's atmosphere. A great deal has already been accomplished in the unknown and difficult path of the conquest of space, the Moon and planets, but much still remains to do. Ahead lie difficulties and, perhaps, losses...

Peoples of the Earth bow their heads before the shining memory of Soviet and American cosmonauts who have devoted their lives to the interests of science and progress. The work begun by the first cosmonauts will continue. As Yuri Alekseyevich Gagarin has said, "The difficulties and obstacles cannot force man to turn off the chosen path. While hearts still beat in their chests, cosmonauts will always assault the unknown..."[2].

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* Numbers in the margin indicate pagination of original foreign text.

Scientific and technical progress has opened up to mankind a previously unknown sphere of activity. Especially exciting prospects will open up as the result of the conquest of the Moon and the nearest planets. And this will essentially and, undoubtedly for the better, change life on Earth. /4

The Soviet Union and other socialistic countries attach great importance to the legal regulation of problems developing in the course of space research.

An important role here must be played by the United Nations which, according to Paragraph 4, Article I of the UN Charter, is called upon to be "a center for harmonizing the actions of nations" in the attainment of common goals. So far member nations of the UN have approved such international documents (important for the new sphere of activity) as the Treaty on principles of activity of nations in the exploration and use of outer space, including the Moon and other celestial bodies (27 January 1967), the Agreement on cosmonaut safety, the return of cosmonauts and the return of objects lost in space (22 April 1968), the Convention on responsibility for damage caused by space objects (29 March 1972). In turn, a discussion of the drafts of international documents on the Moon and on principles of the use by nations of artificial earth satellites for direct television broadcasting, was introduced by the Soviet Union for consideration of the UN General Assembly.

In undertaking the exploration and use of outer space, the Moon and planets, nations must understand that this activity must be conducted for the good of all mankind. "We must do everything possible so that the peoples of the Earth can live in safety, cooperation and communication with each other. Such is the urgent duty of our time," said L.I. Brezhnev at the Soviet Embassy in the United States. "From outer space our planet looks even more beautiful, although small. It is big enough to live on it in peace, but too small to subject it to the threat of nuclear war " [3].

The subject of our study will be only the Moon and the nearest planets, /5 although, as we all know, the solar system contains several thousand asteroids, comets and many small meteorite bodies. We shall use the terminology

accepted in space law and refer to them as celestial bodies.

In recent years planetary sciences have experienced a period of rapid development. The use of radioastronomy, radar and infrared spectroscopy has produced a significant amount of interesting and unexpected information and helped us become better acquainted with our "neighbors" in the solar system.

At the present time the most practical subject for scientific exploration of the planets is study of the Moon, Venus, Mars and Jupiter, in part because they are better known than the others and their further exploration promises even more new discoveries which will restore missing links in the chain of man's knowledge of the secrets of nature; in part because they are more accessible for exploration and use than other planets located farther from the Earth (for instance, Mercury and Saturn) [4].

Only 15 years has passed since the start of systematic exploration of celestial bodies and pennants with the emblem of the Soviet Union are on all the natural space objects closest to the earth: the Moon, Venus and Mars. This is a symbol of the expansion of the sphere of intelligence and work beyond the limits of our planet, a mark of the active penetration of man into other worlds.

The Moon and planets are being studied by many countries. Especially important for the successful solution of numerous problems is the organization of international workers. No one country, no matter how high its level of scientific and technical development, can by itself, in isolation, work out the varied problems in studying celestial bodies. Of especially great importance is international cooperation in solving practical, applied problems of space communication, space meteorology, etc.

* * *

Scientific and technical progress inevitably affects the most varied aspects of life in human society. The conquest of the air, the discovery of the /6

atom and other scientific achievements have radically changed the life of society, directly affecting economics, law, politics, education and culture.

Space research has had a special effect on many branches of learning. Several did not begin to develop at all until the beginning of the space era (space medicine and biology, space meteorology, space law, etc.). The creation of the first sputniks and spacecraft and automatic devices able to move along the surface of the Moon stimulated the unprecedented development of metallurgy, electronics, natural sciences and other branches of learning.

The exploration of outer space and celestial bodies in due course will have an even greater effect on the development of many "earth" sciences; it will enrich mankind with new knowledge about the laws of nature and new concepts about various phenomena.

It is well known, however, that the scientific and technical revolution does not imply only possibilities of mighty creation. It could turn into huge disasters for mankind. For space activity, the main question is what purpose will it serve: that of peace and progress or that of destruction and war.

Now facing mankind in all its magnitude is the problem of ensuring the peaceful direction of the conquest of space, of doing everything possible so that scientific and technical achievements are used for the good of man and not to harm him.

The realization of grandiose plans and projects to explore and use outer space also presupposes unification of the forces and means of all nations, the achievement of a qualitatively new level of international relations.

Scientific and technical progress, including space achievements, also affects international relations and international law regulating them. In the area of international law, scientific and technical progress "expands the sphere of application of generally-accepted principles of international law, the development and formation of new international law principles and standards, the /7

creation of new branches of international law," [5].

The conquest of outer space and the mutual relations between nations developing in connection with it are responsible for a new branch of international law — space law. The main task of space law, as of all international law, is to help solve the most important problem of modern time —maintaining and preserving international peace.

The formation of international space law has been greatly affected by the participation of the USSR in international law in this area. The Soviet Union, having initiated the conquest of outer space, has played an active role in creating principles and standards regulating the activity of nations in outer space. The Soviet Union was either by itself the initiator of international agreements in the field of space or its position and that of other socialist nations played the decisive role in harmonizing these documents [6].

The conquest of space inevitably infringes upon the interest of all nations. Legal and political consequences of the conquest of outer space have drawn a great deal of attention from the UN and those of its specialized agencies connected with space research.

In June, 1956, more than a year before the historic launch of the first Soviet earth satellite, the Assembly of the International Civil Aviation organization (ICAO) in Caracas discussed a report which emphasized the necessity of agreed solutions with regard to the exploration and use of outer space. In the report it was noted that the principles of national sovereignty are inapplicable in space. In particular, the Civil Aviation Convention, adopted /8 in Chicago in 1944, recognizes complete and exclusive sovereignty of nations over air space stretching over their territory. However, nowhere in it is it mentioned that sovereignty extends beyond the boundaries of air space. ICAO noted the necessity of studying these problems, as any spacecraft before it reaches outer space must intersect the atmosphere [7].

From the very start of space activity the UN has been concerned with its legal aspects, seen in its creation of the Committee on the peaceful exploration and use of outer space (UN Committee on Outer Space). As an auxiliary organ of the UN General Assembly this Committee is called upon to work out practical measures for a program of cooperation in the peaceful conquest of outer space. One of the subcommittees of the UN Committee on Outer Space, namely the Judicial, is considering legal questions of the exploration and use of space, discussing and coordinating proposals and drafts of pacts and agreements concerned with actual problems of cosmic activity.

The UN Committee on Outer Space plays the leading role in the scientific and technical and legal regulation of the activity of nations in exploring outer space. It is the center for maintaining and developing international cooperation in the area of exploration and use of outer space for peaceful purposes[8].

Standards of space law are formed at a faster pace than those of other branches of international law — maritime and air. International maritime law was formulated over centuries; standards of aviation law over decades. Having begun a little over 15 years ago, space activity-more correctly, several of its aspects-is already regulated by numerous legal standards.

Guided by the Resolution of the UN General Assembly 1802 (XVII) of 14 December 1962, indicating the "necessity for progressive development of international law as it concerns further development of basic legal principles of the activity of nations in exploring and using outer space"[9], as well as the Declaration of legal principles of the activity of nations in the exploration and use of outer space, adopted by the UN General Assembly which proclaimed the principle of application to space activity of nations of standards of international law, including the UN Charter, the UN Committee on Outer Space in 1966 prepared the first general international treaty in the field of space law. The Treaty on principles of activity of nations in the exploration and use of outer space, including the Moon and other celestial

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bodies, prepared by the joint forces of nations striving for genuine international cooperation in the conquest of space and signed by the majority of nations on 27 January 1967 [10], legally confirmed the provisions and principles contained in the resolutions of the UN General Assembly and gave them the necessary legal force.

The 1967 Treaty on Outer Space, because of its general nature and basic value for all aspects of the conquest of space, can be considered an international codex, formulating the basic rules by which nations must be guided in their space activity. However, extension and complication of its scope required specification and further development of individual provisions of the Treaty.

As was correctly noted by the American lawyer Charles Rhyne, "Law must precede and not follow man into outer space in order to prevent its unfair use as an arena for military action. It must preserve outer space for all mankind [11].

The first agreement concretely defining and developing the provisions /10
of the Treaty on Outer Space was signed 22 April 1968. The agreement establishes legal standards regarding specific and complete determination of the field of space activity of nations. This Agreement is a significant contribution to the progressive development of standards of space law.

The next step on the path of formulating space law and concretely defining the provisions of the Treaty on Outer Space was the international Convention of responsibility for damage caused by space objects signed by the nations 29 March 1972, which regulates specific problems of space activity [13]. The Convention was worked on for many years by the UN Committee on Outer Space and its Judicial Subcommittee. In the course of prolonged work on the text of the Convention many complicated problems of the responsibility of nations for damage caused as the result of space activity were resolved. The Soviet Union, together with other socialist countries, put forth maximum effort to harmonize mutually-acceptable solutions.

To supplement and develop the regulation of these problems, the Soviet Union concluded a number of bilateral agreements on technical aspects of the conquest of space with other socialist nations as well as with France, the United States and other countries.

The Soviet-American agreement to cooperate in the exploration and use of outer space for peaceful purposes, signed during the state visit of the US President Richard Nixon to the USSR in May, 1972, goes beyond the bounds of a purely technical agreement. Article 4 of the Agreement contains a provision of great importance for further formulation of space law standards. It proclaims as an object of special concern of the two nations the responsibility "to promote international forces directed toward solution of international law problems concerning the exploration and use of outer space for peaceful purposes in the name of strengthening law and order in space and further development of international space law..." [14]. Although this provision is included only in a bilateral agreement, it is difficult to overestimate its importance for universal legal regulation of this new sphere of human activity. /11

The rapid and grandiose-scale achievements in the conquest of space raise ever newer and newer international law problems. As human activity in space, in particular on the Moon, is extended and complicated, a need will arise for newer standards of space law.

In this connection, very important and timely are certain diplomatic initiatives displayed by the Soviet Union in June 1971 when it introduced a proposal to include on the agenda of the XXVI session of the UN General Assembly a point headed "On the development of an international agreement on the Moon" and submitted for consideration of the General Assembly the draft of an international lunar agreement [15]. On 29 November 1971, the Assembly adopted Resolution 2779 (XXVI), in which the UN Committee on Outer Space suggested discussing the development of a draft of the lunar agreement and reporting the discussion to the XXVII session of the UN General Assembly.

Therefore, the initial activity of nations in the exploration of outer space, which immediately took on an international character, necessitated its international law regulation. "International law regulation of the space activity of nations has become a categorical demand of the present and an historical necessity "[16].

Standards of space law, generated by scientific and technical achievements in the conquest of space and based on legal experience accumulated in other branches of law, are founded on general international law principles regulating relations between nations.

Because of certain specifics of this new sphere of activity the formulation of space law will follow an independent path, staying within the policies of commonly-accepted standards and principles of general international law. /12

During the development of space law, progressive legal thought is conflicting with forces which do not share the spirit of standards ensuring peaceful trends in the conquest of outer space and celestial bodies. However, the stubborn struggle of the USSR and other peace-loving forces has already led to the development and adoption of standards and principles obliging nations to explore and use outer space, including the Moon and other celestial bodies, exclusively for peaceful purposes in the interests and for the good of all nations. Initial successes in the formulation of standards of space law are a sign that further development of these standards will also follow along the correct path. The United Nations, primarily the UN Committee on Outer Space, and such specialized institutions as the World Meteorological Organization, the International Telecommunications Union, the World Health Organization and the International Civil Aviation Organization, are called upon to play an undoubtedly important role.

In view of the expanded scale of the conquest of space, especially since active and planned exploration of the Moon and nearest planets has begun, the lack of a permanent agency to regulate and coordinate space activity of nations

is ever-increasingly evident.

The report of the special Working Group to the XI Colloquium on the Law of Outer Space before members of the International Institute of Space Law raised the question of the creation of a UN space agency to govern celestial bodies. Such an agency would supervise commitments ensuing from the Treaty on Outer Space. As to the use of celestial bodies, the agency would allot concessions to nations or distribute the mineral resources of celestial bodies. The report also indicated the necessity for the UN to participate in governing celestial bodies [17].

The Canadian lawyer R. Mankevich spoke to the XI Colloquium in the same /13
spirit. He noted that the solution of legal problems in the use of celestial bodies necessitates the creation of an international organization to provide for the interests of all nations by distributing licenses among them. Only such a measure, in his opinion, would guarantee mankind against such use of outer space which might intentionally or unintentionally be a threat to life on Earth or change its environment [18].

The creation of a special international organization for the legal regulation of activity on celestial bodies was also endorsed by the American lawyer E. Brooks. Such an organization, in his opinion, would rationalize and coordinate the exploration of celestial bodies and optimum use of their resources and would help avoid excess expenditures and duplication of activity. In addition, it would guarantee economical advantages for all and exercise guardianship of celestial bodies on behalf of mankind [19]. Brooks and other authors are, as a rule, in favor of this organization being created within the limits of the UN or acting in its behalf.

The idea itself of a special international space agency (not only for celestial bodies) raises no objections and deserves attention, although there is no urgency to solve this question. The creation of such an agency would probably necessitate taking into consideration the experience of other similar institutions. It is important here that the agency encourage further extensive

cooperation between nations in all aspects of international space activity in the interests of the equitable use of the fruits of exploration and utilization of space, as well as support of proper law and order in the new sphere of activity. "It can be assumed," writes A. S. Piradov in this regard, "that in the near future nations will feel it advisable to create an international space agency to harmonize the actions of nations in the area of exploration and use of outer space and celestial bodies "[20]. /14

With the present state of international relations, when some nations take exception to restraint of the use of outer space for military purposes, to renouncing forever the use of force in international relations, it is, evidently, too early to assume that the UN has the privilege of complete regulation of such a complex sphere of national activity as exploration and use of outer space, including the Moon and other celestial bodies.

It seems to us, at the present level of space exploration, that nations can completely solve the most complex international questions concerning the conquest of space on a bilateral and multilateral basis by expanding the sphere of agreements and treaties regulating individual aspects of the matter. In our opinion, the conquest of the Moon and planets exclusively for peaceful purposes could be ensured in the future by a special international agency which would also coordinate scientific and economical measures of nations. Such an establishment could also give legal recommendations concerning activity on celestial bodies.

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CHAPTER I

CELESTIAL BODIES AND INTERNATIONAL LAW

/15

1. Definition of the concepts "celestial body" and "exploration and use for peaceful purposes."

If we look over international documents concerning the conquest of space, we cannot fail to note that along with other concepts they include "celestial body" and "exploration and use for peaceful purposes." We must first of all discuss the legal definition of "celestial body."

All international documents in the field of space law, along with the concept "outer space," use "celestial body." It is clear that legal and astronomical concepts of "celestial body" do not agree. The astronomical, physical concept of celestial body, including all natural bodies in outer space having mass, cannot satisfy the lawyer[1]. Not only the fact of existence of a celestial body is important to the lawyer, but also the aspect of activity on it and subsequent legal relations. Therefore, in the future we shall speak only of the legal aspect of the concept "celestial body."

Not one of the international documents in which the term "celestial body" is used gives its definition or even an interpretation. Therefore, especially at the beginning of the first space decade, in 1962-1965, lively discussions were conducted on the definition of this concept.

"An essential element in the legal definition of celestial body," pointed out the Argentine lawyer M. Vazquez, "is the possibility of its being the object of law"[2]. The well-known Polish lawyer M. Lachs, noting that a celestial body is part of outer space, wrote that the term "celestial body" is used as a universal definition for many solid bodies in outer space [3]. "From the point of view of space law," indicated the Hungarian lawyer G. Gal,

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"celestial bodies are the Moon and planets, their moons, asteroids (or planetoids) in our solar system which are suitable for landing manned or unmanned spacecraft, have a natural origin and cannot be pushed out of their celestial orbits"[4]. The lawyer, in the opinion of G. Gal, is interested only in a sphere where there can be activity regulated by standards of law: Mercury, Venus, Mars with its satellites Phobos and Deimos, the Moon as well as the majority of asteroids rotating around the sun between Mars and Jupiter. "From the point of view of space law," writes G. Gal, "celestial bodies must include only those asteroids which are suitable for landing, although from the astronomical point of view all asteroids are, undoubtedly, celestial bodies"[5].

We must note that there is no single opinion among lawyers on the question of asteroids and their possible use. Very little has been written about their utilization for Earth needs. It has been assumed that space stations could be built on asteroids and minerals extracted. For example, there is the interesting prospect of using ferronickel asteroids, which comparatively often intersect the Earth's orbit. They are composed of 90% iron and 9% nickel; the remainder consists of other metals, including gold, silver and platinum. The value of raw materials contained in such an asteroid of even small diameter is very high. With the aid of atomic explosions and rockets, the orbits of these asteroids could be changed in such a way to make them begin to rotate around the Earth, becoming its satellites. A manned space station could be set up inside the "trapped" asteroid, using its thickness as /17
a protective screen from solar radiation. Of course, this kind of space activity will in the future require special legal regulation, especially in the interests of preventing harmful consequences for man.

Of great interest is the following definition of a celestial body developed in 1964 by the Working Group created within the International Institute of Space Law: "Celestial bodies are natural objects in outer space, including their gas coronas, which cannot be artificially shifted from their permanent natural orbits." Later, taking into account the text of the 1967 Treaty, the definition was slightly revised: "Celestial bodies, according to

the Treaty on Outer Space, are all natural objects in outer space within the solar system, the use of which by a nation or group of nations must not change their natural orbits or absorb them" [6].

This latter definition to a greater degree reflects the prevailing ideas in international law doctrine of space law. As can be seen, one of the characteristic features of the use of celestial bodies is considered to be use as the result of which their natural orbit is unchanged. The aspect of absorption of the celestial body is also included. These two aspects of the definition devised by the Working Group are, in our opinion, not properly understood and illegal and themselves require definition. In particular, what kind of celestial bodies are these whose orbits cannot or must not be changed? Evidently, it is a question of small meteorites and asteroids. In the future, science may decide that in the interests of progress it is advisable to change their orbits. In this case the problem arises of the legal consequences of such activity. It seems that actions whose legal nature is still unclear should not be included in the general definition.

The Bulgarian lawyer Marco Marcoff by the term "celestial body" means any natural cosmic object which is suitable for conquest by man and the use of which can be controlled by scientific or technical means [7]. However, in this rather good definition there is no indication of the aims and purposes which nations set for themselves in the exploration and use of celestial bodies. /18

The Soviet lawyer G. P. Zhukov gives his own definition of a celestial body. Based on international documents, he concludes that "by celestial bodies we mean natural cosmic bodies of a certain size with a hard surface."[8] Evidently, by indicating "hard surface," the author wanted to emphasize that such celestial bodies as the sun and comets are not covered by the definition of celestial body from the legal point of view. In this definition " certain size" is also unclear.

It must not be forgotten that, in the absence of proper law and order, any activity, in particular that with an international character, is fraught with

the danger of misunderstanding and, perhaps, conflict. A legal definition, in our opinion, could help avoid them. It seems that the most significant aspect in the definition of "celestial body" is that it is the object of activity of nations, undertaken for peaceful purposes and directed toward expanding the knowledge of the unknown.

In working out a definition of "celestial body" we must also not forget one peculiarity. Imagine that in the distant future a highly developed civilization is discovered on some far planet. Relations with its inhabitants will hardly be based on the standards and principles of "Earth" international law.

Based on the above, in our opinion, the following legal definition of a celestial body is possible: space law understands by celestial bodies natural uninhabited cosmic bodies which nations have a right to use in the interests of progress and exclusively for peaceful purposes.

We must mention that one of the most complicated problems in legal science is that of definitions. It is possible that scientific and technical achievements will introduce serious corrections in any present definition. Nevertheless, development of an acceptable definition is necessary in the interests of providing solid law and order in the sphere of space activity. /19

Now we must also dwell on concepts encountered in all international law documents in the area of space, namely "exploration and use for peaceful purposes." As is known, this expression is found in the earliest international documents adopted by nations within the UN in connection with the beginning of space activity. Nations immediately regarded as of paramount importance "the common interest of mankind in the development of the use of outer space for peaceful purposes" [9].

The Treaty on Outer Space of 1967, having preserved the wording of the earlier UN resolutions, gave compulsory force to the principle of exploration and use of space for peaceful purposes. In addition, mentioning this principle in several articles (Paragraph 1, Article I; Paragraph 2, Article IV,

in Articles IX and XI), it expanded and enriched the concept of exploration and use of outer space (including the Moon and other celestial bodies) for peaceful purposes. This is grounds for considering the principle of exploration and use of space for peaceful purposes as a basic standard of modern space law [10].

This can with good reason be included in the category of generally-accepted principles in the doctrine of international space law. However, we must not fail to note significant differences in its interpretation.

In the literature (both Soviet and foreign), defining the concept "peaceful purposes" has always been given a great deal of attention.

Soviet authors [11] are unanimous in understanding this principle as /20
allowing exclusively "nonmilitary" activity. The meaning of "peaceful use," reflected in international law documents on questions of space, corresponds to the generally-accepted understanding of this term in other spheres of legal regulation. The concept "peaceful use" is widely used in international treaties with regard to the legal status of new spheres or regions of national activity, in material and documents used, for example, in discussions of disarmament and limitation of the arms race. As noted by G. F. Kalinkin, "despite different contexts of the use of this concept, the meaning of this expression in all cases is identical: everywhere it means use for nonmilitary, civilian purposes, it excludes any kind of military activity, regardless of the purposes and intent of such activity " [12]. The concept "peaceful use of outer space" with such an understanding excludes measures of a military nature which could create a threat to international peace and safety. Such an understanding agrees completely with the generally-accepted standards of international law and the UN Charter. This is also indicated by previously adopted international documents, particularly the Treaty on Antarctica of 1959 [13] and the Charter of the International Atomic Energy Agency (IAEA) of 1956 [14].

In Article I of the Treaty on Antarctica it is stated directly and unequivocally that in the interests of all mankind "the Antarctic is to be used

only for peaceful purposes. In particular, any measures of a military nature, such as the creation of military bases and fortifications, military maneuvers or testing of any kind of weapons, are forbidden." The article perfectly clearly defines the concept of the use of the territory of Antarctica for peaceful purposes. The Article on "The use of Antarctica only for peaceful purposes" in combination with the ban on any military measures and the list of typical forbidden measures indicates that the concept "peaceful use," according to the Treaty of Antarctica, is equivalent to a complete ban on any military activity in Antarctica [15]. /21

The example of Antarctica could play a positive role in formulating similar principles and standards in relation to other regions of the earth, in particular outer space, where consequences of a strained international situation are fraught with the possible danger of a violation of the peace.

We find a similar understanding of peaceful use in Article II of the IAEA Charter where it is emphasized that "the Agency is attempting to achieve faster and more extensive use of atomic energy to maintain peace, health and well-being in the entire world. As far as possible the Agency guarantees that its help will not be used to further any kind of military purpose" [16]. The purpose of this resolution is not only to ensure the peaceful use of atomic energy, but also to caution against its use to further military aspirations in any degree.

Such an important achievement of human intelligence as penetration into outer space and the conquest of celestial bodies must, all the more, be unconditionally used exclusively for peaceful purposes. Activity whose consequences are international in scope must not include military measures, as they could inevitably further the very "military purpose" indicated in the above Article of the IAEA Charter.

G. P. Zhukov was perfectly correct in 1962 when he wrote: "The concept of peaceful use of outer space means conducting scientific research in upper layers of the earth's atmosphere and in interplanetary space directed toward studying the effect of the outer world on living conditions on our own planet,

toward deeper understanding of the laws of the universe and, finally, ensuring the possibilities of man's complete mastery of outer space" [17]. /22

The space programs of the Soviet Union are being conducted with these exclusively peaceful purposes and include launchings past and onto the surface of the Moon. Peaceful use of outer space, the Moon and planets must not include any other activity except that which is intended for scientific research or practical measures to prepare for and assure conquest of the nearest planets in the solar system.

Such an understanding completely agrees with the Treaty on Outer Space of 1967. The Preamble of this Treaty proclaims "the common interest of all mankind in the progress of exploration and use of outer space for peaceful purposes" and urges development of extensive international cooperation in both "scientific and legal aspects of exploration and use of outer space for peaceful purposes." In addition, it is here stated that the Treaty will "enable realization of the purposes and principles of the United Nations Charter," i.e., no situations are allowed "which might lead to a breach of the peace" (Paragraph 1, Article I, UN Charter) and appropriate measures will be taken to "strengthen universal peace" (Paragraph 2, Article I, UN Charter).

Point 2 of Article IV of the Treaty permits exploration and use of the Moon and other celestial bodies exclusively for peaceful purposes and forbids "the creation on celestial bodies of military bases, armaments or fortifications, the testing of any type of weapons or any military maneuvers." The exclusively peaceful use of celestial bodies is confirmed by the provisions of Articles I and III of the Treaty, obliging nations to conduct space explorations "for the good and in the interests of all countries" and in the "interests of maintaining international peace and safety."

The Treaty on principles of national activity in the exploration and use of outer space, including the Moon and other celestial bodies, containing the /23
obligation to carry out space explorations for peaceful purposes, was signed

by more than 100 nations. However, in bourgeois legal science the concept "peaceful use of space" still includes measures of a military nature if they are not acts of direct agression. Thus, peaceful use of space is identified with its use for nonagressive purposes. An attempt is thereby made to justify the plans of some militaristic circles to use the conquest of space to attain military superiority over countries of socialist cooperation. And such plans and corresponding theoretical concepts are being brought forward despite the fact that standards of the Treaty on Outer Space allow the use of space exclusively for peaceful purposes. Attempting to interpret "peaceful use of celestial bodies" as including military measures of a nonagressive nature, some bourgeois authors simply want to help militaristic imperialistic circles turn outer space and celestial bodies into a theater of military actions.

American lawyers have declared, for example, that "bases on the Moon and other celestial bodies can be used to establish supremacy over the vast expanses of the unknown; the discovery of valuable materials and new forms of energy could increase the power of a nation on Earth and in outer space" [18]. And the English lawyer W. Jenks frankly suggested developing the right of military use of outer space [19].

Soviet jurisprudence rebuffs such attempts to substantiate the right to use outer space for military purposes and the necessity of separating military space activity from peaceful. "Analysis of these statements of foreign lawyers," noted Yu. M. Kolosiv, "shows their typical fetishism of space activity, advocating the powerlessness of nations to solve the question of separating military space activity from scientific to forbid the use of space for military purposes" [20]. /24

The concept "use for peaceful purposes" by its very nature indicates non-military, civilian activity and excludes military, including, of course, agressive activity which is, therefore, forbidden by the standards of international law.

2. International law doctrine of the legal status of celestial bodies

Due to the rapid conquest of space, the development of space law gives rise to a number of new legal concepts and principles. Such legal concepts as outer space, the boundaries of outer space, celestial body and the exploration and use of celestial bodies for peaceful purposes have never before been encountered in international law. In Soviet and foreign literature on problems of space law, attempts have been made to interpret several concepts. However, in our opinion, it is clearly inadequate and work in this direction must be continued.

Among the new standards we can first of all include the proposition, consolidated in Article II of the 1967 Treaty on Outer Space, that the Moon and other celestial bodies "are not subject to national appropriation." Based on old concepts and dogmas of the theory of international law, it can be assumed that the Moon and planets, not being the property of one nation, will become the object of appropriation by individual nations or a group of nations. We have in mind one concept of the legal regime of celestial bodies, namely res nullius, in accord with which celestial bodies are considered as newly-discovered territories, acquired in accordance with principles of occupation. Historically, as is known, claims to new territories have been based on their discovery, occupation, exploration, cession, effective utilization, prolonged residence, etc.

From the beginning of the era of space explorations and legal regulation /25
of the new sphere of activity, nations have followed the path of refusing to declare sovereignty over celestial bodies. We must note that the first two space powers — the USSR and the USA — approach the problem in the same way, despite differences, in some cases, in the motives of such an approach.

A similar position was expressed in the resolutions of the UN General Assembly in connection with the exploration and use of outer space and celestial bodies. Later this legal principle was consolidated in the 1967 Treaty and in other agreements.

A decisive role in the formulation of the principle of "nonappropriation" was played by the Soviet doctrine of space law [21]. As the result of broad discussion of the draft of the Treaty on Outer Space, a standard was adopted forbidding national appropriation of outer space, including the Moon and other celestial bodies "by proclamation of sovereignty over them, by utilization or occupation or by any other means" (Article II of the Treaty on Outer Space).

The right of free exploration and use of outer space and celestial bodies for the good and in the interests of all countries can also be considered a new standard in space law [22]. Unknown to international public law of the "pre-sputnik" period, this standard guarantees against claims of individual nations to territorial sovereignty, national appropriation or the establishment of any kind of exclusive rights. This standard does not contradict the proposition contained in Article VIII of the 1967 Treaty on maintaining the rights of property and jurisdiction over objects and their parts lost in outer space as well as over the crew.

The application of standards of international law to celestial bodies. The UN General Assembly Resolution 1721 (XVI) entitled "International cooperation in the use of outer space for peaceful purposes" unanimously adopted on 20 December 1961, was the first to refer to celestial bodies as objects of international law regulation. /26 The Resolution proclaimed that "international law, including the United Nations Charter, applies to outer space and celestial bodies."

In discussing the Declaration of legal principles of the activity of nations in the exploration and use of outer space (1963) in the UN Committee on Outer Space, doubts were expressed, particularly by the French representatives, concerning the applicability of standards of international law to the activity of nations in outer space on celestial bodies. If, in their opinion, "traditional international law was meant, whose principles are completely effective in relation to land territory, sea and air, then this rule cannot be applied to outer space in the form in which it exists." They were referring to the fact

that the the Declaration included the proposition that outer space and celestial bodies are not subject to national appropriation. The representative of Brazil also came out against "unqualified application of international law to outer space" [23].

Other Western lawyers also have taken these stands in relation to the application of standards of international law, including the UN Charter, to activity in outer space. According to the opinion of the English researcher W. Jenks, on a number of questions there is a trend toward separating space law from conventional international law. A shining example is the principle of nonappropriation of outer space and celestial bodies, which places outer space on a different status from airspace. As celestial bodies can be physically occupied, this principle deeply contradicts the traditional right of acquisition of unpopulated territories on earth. Summarizing his opinion, Jenks, nevertheless, acknowledged: "How much international law will have practical application in space will, of course, depend on events in space; however, it is important to proceed from the principle that the activity of nations does not cease to be the object of international law when it extends /27
beyond the limits of the atmosphere" [24]. As can be seen, even the "conjectural" argument of the English lawyer cannot fail to lead him to the opinion that there is no spatial limit for international law and that it applies to any celestial body.

However, in the absence of prohibitive standards, nations could use their own discretion. Therefore, it was necessary to formulate such a standard. It first appeared in the Moscow treaty prohibiting testing of nuclear weapons in the atmosphere, outer space or underground, signed on 5 August 1963.[25] Then the 1967 Treaty on Outer Space, in the development of principles outlined by the resolutions of the General Assembly but not legally binding for nations, prohibited appropriation of any kind whatsoever of celestial bodies.

Considering an international treaty as one of the important sources of law, it can be assumed that standards of international law apply to celestial bodies the same as to all outer space and to activity on them. But it

is solely a matter of progressive standards and principles of international law.

Emphasizing the distinctiveness of the new sphere of human activity in space, the Polish lawyer M. Lachs wrote that proclaiming standards of international law and the UN Charter as guides in conducting space activity "does not mean automatic application of international law as a whole. Some concepts of international law intended for other conditions are not applicable to outer space " [26].

Standards of international law which do not pertain to space law, nor, of course, to celestial bodies, M. Lachs feels, first of all, are those such as lex specialis which concerns one particular medium exclusively, and secondly, those which have been changed or replaced by lex specialis in relation to outer space.

Here we must first indicate one of the basic principles of space law — /28
the principle of nonconquest of outer space, the Moon and other celestial bodies. According to this principle, the legal regime of outer space differs sharply from that, for example, of airspace, by which nations, according to international law, have complete and exclusive sovereignty. In the same way methods of acquiring territories in accordance with the theory of international law cannot be applied to celestial bodies which, according to the Treaty on Outer Space, are "not subject to national appropriation" by any means indicated in Article II.

According to Article III of the 1967 Treaty, in activities concerned with the conquest of outer space and celestial bodies, nations must be ruled by such basic principles of international law as peaceful coexistance of nations with different political and socio-economic structures, peaceful solution of disagreements, prohibition of military propaganda, nonagression, etc.

Nevertheless, the specifics of the new sphere of human activity have raised many legal questions requiring urgent resolution. Modern international

law and such of its branches as maritime and air law cannot give ready prescriptions. True, there has been no shortage of analogies, at times extremely well reasoned. Thus, attempts have been made to compare celestial bodies with islands in the open sea [27], with sectors created in Antarctica [28], etc.

Now when the Treaty on Outer Space is in effect, having laid a foundation for the establishment of a legal regime on the Moon and other celestial bodies, there is no need to discuss in detail all the numerous theories and concepts which have been advanced previously [29].

However, we must, even if only briefly, discuss two opposite concepts of the legal status of celestial bodies — res nullius and res communis.

Using the terminology of Roman law, some lawyers have considered outer /29
space as res nullius (property without a master), others as res communis (collective property) or res communis omnium (property belonging to all). Although these concepts have their roots in ancient civilizations and were occasioned by the peculiarities of inter-relations of the time, both have won a large number of advocates.

One of the adherents of res nullius, the Brazilian lawyer Verplatz, indicated that celestial bodies cannot be considered res communis, as this requires general agreement, as in the case of the open sea. Therefore, all uninhabited planets by their nature are res nullius and their effective and prolonged occupation would give the right of sovereignty [30]. Advocates of this concept have felt that individual sovereign nations can occupy celestial bodies even without any international agreement. Of course, such a position contradicts the common interests of mankind. As noted by the Japanese lawyer F. Ikeda, planets must not be appropriated by sovereign nations, they must be placed under international control and government in the common interests of all mankind [31].

Some lawyers liken celestial bodies to islands in the open sea. This position has been expressed by the West German lawyer Ingo Münch: "Just as space and the open sea are res communis, solid celestial bodies must be considered as islands in space and, therefore, in a legal sense can be placed in the same category with islands in the open sea. The same international law standards as in the capture of islands in the sea could be applied to solid celestial bodies. Celestial bodies, therefore, can be occupied if proper conditions are fulfilled (discovery, intent to take possession and establish effective control)"[32]. The authors of such a point of view, as the Soviet /30
lawyers F. N. Kovalev and I.I. Cheprov have written, did not even take into consideration the dissimilarity of physical conditions of activity on the earth and in space [33].

The majority of lawyers, however, support the concept res communis, considering celestial bodies as common property and, therefore, not subject to occupation and appropriation. This concept is based on the idea that celestial bodies, like the open sea, must belong to all.

Advocates of this concept feel that as celestial bodies, like outer space itself, are res communis and not res nullius, an international agreement must be concluded to consolidate principles according to which no nation will lay claim to sovereignty or other exclusive rights over celestial bodies [34].

At the VI Colloquium on the Law of Outer Space, Argentine A. Cocca suggested that in relation to celestial bodies the concept res communis not be used, but the similar but more appropriate, in his opinion, to current conditions, res communis humanitatis (a thing belonging to mankind) [35]. This concept, reflecting the position of the majority of Latin American lawyers with regard to the legal nature of celestial bodies, was expressed in the draft of an international agreement concerning the use of natural resources of the Moon and other celestial bodies which Argentina presented in 1970.

The practical conquest of celestial bodies, primarily the Moon, once more necessitates emphasizing that legally celestial bodies are the property of mankind and, therefore, any activity on them is from the very start of an international nature.

This served as a guide to the authors of the Soviet draft of the Treaty /31
on the Moon, introduced for consideration to the XXVI session of the UN General Assembly; the Preamble especially emphasized that the "Moon, being the only natural satellite of the Earth, plays an important role in the conquest of space." In the letter of the USSR Minister of Foreign Affairs A. A. Gromyko to the General Secretary of the UN with regard to the Soviet draft of a Moon treaty it was pointed out: "It is necessary not to allow activity of nations on the Moon to be turned into a source of international conflict and to provide a legal base for possible use of the Moon [36].

The problem of analogies. Let us consider here several analogies with legal standards already in effect to which, naturally, lawyers have had recourse when faced with the problem of the legal regulation of the exploration of outer space and celestial bodies. Other branches of law in a number of cases might have served as a source from which space law could draw ideas, institutes and methods of legal solutions.

Of course, mechanical transfer of standards developed for certain conditions (particularly, standards relating to airspace) can also be fraught with harmful consequences. Ye. A. Korovin in connection with this noted: "We must not mechanically apply all theories of international aviation or international maritime law to space; for example, those on the extent of territorial waters or rescue at sea" [37].

However, the method of analogies can, in a number of cases, be essential to formulating new standards corresponding to the new situation. Only with the solution of new space problems can we avoid adopting ready standards and principles. As noted by F. N.Kovalev and I.I. Cheprov, "Successful use of analogies in international law, as the use of strong drugs in medicine, to a significant

degree depends on dosage" [38].

The most appropriate analogies applicable to outer space, in the opinion of the majority of specialists, are the open sea, the continental shelf, Antarctica and airspace. Points of view have often been expressed, the essence of /32
which is that there is no real difference between outer space and the Earth's atmosphere. Even a special term has been introduced into circulation to reflect the sameness of both spheres — "aerospace." Here, under the guise of a need to convert to a unified system of air and space law, has been dragged in the idea of giving up the allegedly obsolete principle of national sovereignty of airspace [39]. The Canadian author N. M. Matte wrote: "Differentiation of air (atmospheric) law and space law is artificial and temporary. It is as temporary as recognition of certain principles of international law such as absolute sovereignty, unlimited freedom and equality of nations. In view of the swift technical progress of recent years we must quickly review these concepts and recognize that space is indivisible and that we must work for the creation of aerospace law" [40].

Especially frequent are appeals to an analogy with the open sea, which, like outer space, is considered res communis omnium or res communis commercium. This point of view has been reflected in a number of monographs and studies of well-known specialists in the field of space law as well as in the pronouncements of statesmen of the USA and other countries [41].

Advocates of such an approach most often enlist principles of freedom and general use adopted in relation to both spaces. Taking into account the principle of the prohibition of appropriation of outer space and celestial bodies, consolidated in space law, at first glance it is quite difficult to keep from making a direct analogy. It is universally recognized that even nations without direct access to the sea have the right to use the open sea and to have ships carrying a national flag; they also have the right of peaceful passage /33
through territorial waters. The 1958 Geneva Convention on the open sea consolidated as a standard of modern international law the right of free use of the open sea by all nations, both those with a coastline and those without [42].

Let us just recall Article 2 of the Geneva Convention on the open sea, which would seem to be completely applicable to outer space. At the beginning of the Article it is stated: "The open sea is open to all nations and no nation has the right to lay claim to subordination of any part of it to its sovereignty..." It would seem that other articles of this Convention might also be applied analogously to outer space, in particular, the articles concerning the nationality of vessels (Art. 5), the exclusive jurisdiction of the flag nation (Art. 6) and rescue (Art. 10).

However, despite several common characteristics of the status of outer space and that of the open sea, they essentially differ from each other.

In this connection it is very important to note that individual bourgeois lawyers deny the normative nature of the principle of freedom of the open sea; for example, they relate freedom of the open sea not to standards of international law, but to its doctrine [43].

The open sea, like outer space, is of vast military importance. But events occurring on the high seas (shipwrecks, airplane catastrophes at sea, etc.), be they in peace time or wartime, in the majority of cases are not a direct threat even to coastal nations. Analogous events in outer space (spacecraft or lift-off failures, falling pieces of equipment, etc.) can present a danger to many nations. And their safety would be directly threatened by reconnaissance measures in outer space or from celestial bodies, as they /34 are more effective than such measures conducted on the open sea. Moreover, the history of maritime law is, unfortunately, too closely connected with naval battles, including those for possession of islands in the open sea. It is absolutely impossible to allow standards sanctioning such actions to be absorbed by space law, all the more as it is proven that "space war," in particular with the use of nuclear weapons, or even without them, can have disastrous results.

In addition, maritime law has established different legal regimes for different parts of the open sea. This gives rise to serious controversies and

claims by individual states. And as the open sea before the 17th century was not recognized as "free" and national claims to large areas of the ocean were a common occurrence, this only aggravated such conflicts.

Unfortunately, despite many years of discussion, there is still no agreed single extent of territorial waters for all states. As the American authors recognize, "the principle of freedom of the open sea permits the establishment of sovereignty over parts of adjacent waters as well as diverse national use of extensive areas which are in fact res communis [44].

The status of the open sea also does not rule out the possibility of conducting military maneuvers and exercises using rocket weapons. Military operations in outer space would seriously threaten the safety of many, primarily neutral states and in the case of using nuclear weapons — their very existance.

Summing up, therefore, we must note that regimes of outer space and the open sea must not be considered identical, although some principles and standards pertaining to the open sea could, without doubt, serve as an interesting model for developing standards regulating practical activity in outer space and on celestial bodies.

Analogy with Antarctica. Of definite interest in studying international /35
law questions connected with the conquest of the Moon and other celestial bodies are propositions in the Treaty on Antarctica, signed in Washington, 1 December 1959 [45]. Both Antarctica and celestial bodies are proclaimed by appropriate agreements not to be subject to sovereignty of any one state.

Even in the early stages of discussion of the legal regulation of activity in outer space and especially on celestial bodies, Antarctica has been named among the most appropriate analogies. At first glance there really is quite a bit in common between Antarctica and celestial bodies. Neither is yet suitable for normal human life; means necessary for life in both Antarctica and in the future on celestial bodies must be transported from afar, costing vast sums of

money. However, the Moon, Mars, Venus and other celestial bodies, like Antarctica, will not always be uninhabitable. In the future they will become more suitable, thanks to scientific and technical progress; practical interest in them will undoubtedly increase.

The expanse of space is unbounded and its potential riches are still far from known. Outer space and the celestial bodies it contains, like the vast Antarctic continent, have unusually good prospects for future activity. Information obtained from scientific study of Antarctica on its economical, geographic and strategic position indicates its international importance. The territory of Antarctica is, therefore, of great value to many countries. Because of this question its legal status can be resolved only on the basis of agreement between all interested states with mutual consideration of their rights and interests.

In the doctrine of space law, as in the theory of general international law, the predominant concept has become that according to which the legal regime of spheres of activity which are of international interest must be determined on the basis of agreed solutions of all interested states. Only such an approach /36 can further scientific and technical progress and deepen the close cooperation between peoples.

Let us turn now to the 1959 Treaty, establishing the special international status of Antarctica: 12 states, having successfully concluded the International Geophysical Year of scientific cooperation in Antarctic exploration, signed the Treaty proclaiming among its basic principles the use of this region only for peaceful purposes, freedom of scientific exploration and friendly cooperation between all nations. The Treaty in particular provides that no measures of a military nature can be conducted in Antarctica, including the creation of military bases and fortifications, military maneuvers or tests of any kind of weapons. The Treaty consolidates the principle of international cooperation in scientific research, the proposition of conducting inspections, banning of nuclear explosions and the discharge of radioactive materials. Article XI proclaims the principle of the peaceful solution of controversies with regard

to interpretation or application of the Treaty.

This, however, concludes the parallels which can be drawn with a legal regime possible on celestial bodies. Article IV of the Treaty, concerning territorial problems, cannot serve even as a remote model for solving problems of the legal regime of celestial bodies. The contracting parties did not renounce their territorial claims, the sources of which go back into the history of the discovery and conquest of this polar region. As it states in the Article, nothing in the Treaty must be interpreted as a "renunciation...of previously declared rights or claims to territorial sovereignty in Antarctica" or as "damaging the position of any participant of the Treaty in relation to their acknowledgement or non-acknowledgement of such claims." According to the Treaty, during its effect no activity in Antarctica will form the basis for claims to territorial sovereignty and no new territorial claims will be declared. In other words, claims to territorial sovereignty in Antarctica are not eliminated in general, they are only "frozen" for 30 years while the Treaty is in force (Articles IV and XII).

Taking into account the temporary renunciation of territorial claims in /37
accord with the 1959 Washington Treaty, we can conclude that in relation to outer space and celestial bodies an analogy with the regime of Antarctica would be simply untenable. As far as the complicated problem of prospecting and developing natural resources is concerned, the Treaty on Antarctica does not resolve it and, therefore, cannot be used in discussing an analogous problem concerning celestial bodies. Nevertheless, propositions on peaceful,free scientific exploration of almost inaccessible regions could, to a certain degree, be important in working out a legal regime for the still less accessible expanses of celestial bodies.

It is possible, therefore, to conclude that drawing analogies between the legal regimes of Antarctica and celestial bodies, primarily the Moon, would be justified and logical if the problem of disarmament were already completely solved. For the present, the important strategic value and potential possibilities of using the Moon and other celestial bodies for military pur-

poses (although peaceful purposes are proclaimed to be the chief aim in the conquest of space) exclude close analogies with the regime of Antarctica. As we saw, many complicated problems of the legal regime of Antarctica were not resolved properly by the 1959 Treaty and can hardly serve as adequate analogies in developing unresolved questions connected with the conquest of space and celestial bodies.

Analogy with the continental shelf. Of definite interest in solving a number of problems in relation to celestial bodies (for example, developing their natural resources) is the legal regulation of use of the continental shelf.

Scientific and technical progress, having expanded the possibilities of developing natural resources of the continental shelf, has given rise to a number of international agreements regarding the sea floor and its depths.[46] Critical problems concerning the continental shelf, which conceals vast deposits of oil, are regulated by the Geneva Convention on the continental shelf, concluded 29 April 1958, and taking effect 10 June 1964. /38

G. P. Zhukov adheres to the point of view that an analogy is possible between the use of natural resources of celestial bodies and the continental shelf. He also points out that the 1958 Convention has special resolutions directed toward keeping the regime of the open sea undisturbed [47]. M. Marcoff, on the other hand, feels that establishment of a legal regime of celestial bodies must not involve analogies drawn with the continental shelf or with fishing in the open sea[48]. He explains this as due to the fact that Article II of the Treaty on Outer Space forbids any kind of national acquisition of the Moon or other celestial bodies or parts of them. The right of a coastal nation to the continental shelf for purposes of prospecting and development of its oil arises automatically; this is consolidated in Paragraph 3, Article 2 of the Convention on the continental shelf. The American lawyer E. Brooks also assumes that it is irrelevant to resolve problems concerning the development of natural resources on the Moon and other celestial bodies by analogy with those of nations interested in developing the natural resources of their

continental shelf. "The legal doctrine of the continental shelf," he writes, "is based on coastal proximity...On the other hand, the moon and other celestial bodies do not border on any nation and are far away...They differ even more in that the Convention on the continental shelf gives nations sovereign rights to natural resources, but the Treaty on Outer Space especially forbids their national appropriation"[49].

A special legal regime has been worked out for use of resources of the continental shelf. These resources, being a constituent part or continuation of resources of coastal territory, are no longer considered as res nullius, which can be seized by any nation. The conclusion of the Convention on the continental shelf of 1958 was preceeded by a strong fight, due primarily to the attempt of the USA to formulate the rights of coastal countries to the /39 continental shelf so vaguely and indefinitely that it could reserve to itself paths to penetrate alien shelfs. However, thanks to the solid position of peace-loving forces, headed by the Soviet nation, the point of view prevailed which was based on combining the claims of sovereign rights to the continental shelf for purposes of prospecting for and developing natural resources and the principle of freedom of safe conduct through territorial waters as well as freedom of the open sea.

The conclusion of the 1958 Convention indicated the achievement of an extensive international agreement on questions which had not previously been regulated by international law. On this plane the solution of problems concerning the continental shelf might be a useful model. Problems which arise in connection with the use of the natural resources of celestial bodies, however complicated they are, can also doubtlessly be solved.

Basic attention must be given to ensuring that the interests of individual nations do not contradict the principle of free access of all nations without any discrimination to all regions of the Moon and planets. It is also necessary to show maximum circumspection and give very careful consideration to all possible situations, as there are still "blank" spaces enough and to spare on both the Moon and all the more on the planets for the development of natural

resources.

Analogy with airspace. The point of view of the similarity between regimes of airspace and outer space very indirectly concerns celestial bodies. However, in view of the fact that we are considering the legal regime of outer space and celestial bodies as one subject of study, we must also briefly consider this point of view.

Despite the clearly different legal bases of both regimes, some foreign authors have attempted to draw analogies between them [50].

A different concept is held by Soviet lawyers. "Air law is based on standards differing from those of space law," writes Yu. M. Kolosov, "and the basic standard of air law is national sovereignty of airspac" [51]. The legal result of this standard is, as we know, permission must be granted for foreign aircraft to fly over national territory. The basic standard of the legal regime of outer space is the principle of freedom of outer space. /40

Evidently, in order to exclude the concept that both spaces are identical it is necessary to solve the problem of delimitation of airspace and outer space. We can recall that such a problem has already for several years been mentioned in the agenda of the Judicial Subcommittee of the Committee on Outer Space. However, it has not been subjected to more or less serious discussion. It would seem to make good sense to come to a definite decision in this respect as, on the one hand, it would ensure the interests of nations in airspace and on the other, the interests of the freedom of outer space.

Besides the essential diversity of initial positions in relation to the purposes of legal regulation of the regimes of airspace and outer space, there are also very significant differences in flight and landing methods, flight speeds, the effect of radiation on the crew, as well as in the economic possibilities of planes designed for flight in both spaces.

Slightly closer to the regime of outer space is, perhaps, the legal regime of airspace over the open sea which, according to generally-accepted standards of international law, is free for flights of planes and aircraft of all nations.

The freedom of flight over the open sea derives from the principle of freedom of the open sea. It was stated in Article 2 of the Geneva Convention on the open sea of 1958 which allowed military and nonmilitary aircraft and planes to fly freely in the airspace over the open sea. And although such free flights are not unconditional — they must take into consideration the interests of other nations using the freedom of the open sea — an analogy is inapplicable here. Launching devices into outer space and to celestial bodies for military purposes cannot be allowed, which was also expressed in the Treaty of Outer Space of 1967. /41

In determining the regime of celestial bodies, besides analogies with rules and standards already in effect, there is interest in an analogy with the regime of the world ocean.

The swift development of science and technology brings up the question of exploitation of natural resources of the world ocean. Possible activities concerned with exploiting the resources of the ocean floor and its depths, as in the case of celestial bodies, cause a number of international problems requiring urgent settlement.

We must mention that for comparison we are using legal problems connected with the exploration and use of the floor of seas and oceans beyond the limits of the continental shelf.

Although exploration of the depths of the sea bottom was begun much earlier than that of space, exploitation of the resources of the sea floor, because of special specific difficulties of this new sphere of activity, are proceeding at a relatively slow rate. The resources of celestial bodies and the

ocean floor, which are acutely needed by mankind, are still not very accessible for exploitation and use. In particular, special difficulties are encountered in developing minerals in the floor of seas and oceans. Prospecting and exploitation must be conducted under severe natural conditions (typhoons, drifting ice, currents). The potential consequences of overcoming difficulties are by no means less complicated or dangerous than such activity on the Moon [52].

The possible access to resources of the world ocean and the prospects for their use have been the cause of serious battles between large monopolies of the West for new sources of raw materials. "As before, at the beginning of the 20th /42 century, the fight for sources of raw material occupies the most prominant place in the expansionist politics of monopolies. Just as before, the attempts of imperialist monopolies are directed toward appropriating not only known sources of raw materials but also possible sources" [53].

This also pertains in full measure to known and as yet undiscovered resources of celestial bodies, whose development and distribution vividly "stirs the imagination" of representatives of large monopolies and their apologists.

The legal consequences of activity in the new spheres for these reasons urgently necessitate the establishment of solid law and order there which would ensure observance of generally-adopted principles and standards of international law, an integral part of which are international space law and international maritime law.

We must also note other, more specific legal problems vital for both the sea floor and for celestial bodies. In particular, it is important, on a legal level, to solve the problem of contamination and pollution, most acute from the point of view of using resources of world significance for the good and in the interests of all mankind. Development of questions concerning the responsibility of nations for conducting explorations, for exploitation and use of the resources of the sea floor are included in the working program of the Judicial Subcommittee of the Committee on peaceful use of the bottom of seas and oceans "beyond the effective limits of national jurisdiction." At the

session of the Judicial Subcommittee in August 1969, the USSR delegation suggested in particular adopting the principle of international responsibility for national activity on the sea floor, regardless of whether it is done by governmental agencies, nongovernmental agencies or individuals. An analogous clause was included in the Treaty on Outer Space of 1967.

In discussing international law aspects of the use of the sea floor and celestial bodies one more common problem arises. In relation to the sea bottom this is the question of external boundaries of the continental shelf, which has not been clearly determined. Difficulties also arise in determining where /43
ocean floor space ends, how far the limited jurisdiction of a coastal nation extends (the continental shelf). In relation to celestial bodies it is the problem of delimiting the boundaries of airspace and outer space.

Soviet lawyers feel that the sea floor is not a legal vacuum [54]. The same attitude is also adopted in relation to outer space and celestial bodies. There is a trend toward applying principles and standards of modern international law to those areas where there is human activity. Application of the standards of international law to the bottom of seas and oceans and to outer space, including the moon and other celestial bodies, does not rule out development of new specific standards applicable to them.

Both spheres of activity concern vast expanses and, therefore, directly affect the interests of all nations. In this connection, the only acceptable way of solving the problems of their legal regulation would be the path of international agreement with participation of all interested parties on a contractual basis.

A very important question is the use of the bottom of seas and oceans, outer space and celestial bodies exclusively for peaceful purposes. Legal regulation of this serious problem of modern international relations is extremely important for strengthening peace in the world. Here a proper solution would be agreement about universal and complete disarmament, for which the Soviet Union and other socialist countries with the support of all peace-

loving forces of the world are fighting tirelessly.

We have named only a few aspects essential to the development of a legal regime in comparable spheres of activity. Among these problems we could also name the protection of resources from predatory, irrational use, the construction of exploitation facilities, the creation of an international agency /44
to aid in exploration and use, the problem of cooperation, etc. On this level we can subscribe to the words of the French lawyer C. Chaumont, at the same time applicable to space and to the world ocean: "Space contains elements of international service to society. And it is completely unnecessary to specify exactly to whom space belongs. All that is necessary is international regulation, having as its ultimate purpose common interest" [55].

Therefore, in relation to the use of analogies in developing legal standards to regulate the new sphere of human activity, we must note that here it is necessary to exercise maximum care. The great difference in attitudes on these questions verifies this. And if certain standards concerning either Antarctica or the continental shelf or fishing in the open sea can at times serve as an example, a model for the development of standards regarding the activity of nations on celestial bodies, it is inadvisable and unjustified to consider relations which are different in value and legal consequences which arise from that activity as identical. The new sphere of activity must have its own specific legal regulation; the beginnings of this regulation were included in the first international Treaty on Outer Space, concluded in 1967, i.e., only 10 years after the first successful launch of an artificial Earth satellite by the USSR.

The legal regime of outer space and celestial bodies as a single object of study of jurisprudence. Some bourgeois lawyers hold to the necessity of differentiating regimes of outer space and celestial bodies because the basis of these regimes, in their opinion, is completely different [56].

Such differentiation is artificial, as regimes like outer space itself and celestial bodies, primarily the Moon, are very closely connected and must

be a single object of study.

The American authors S. H. Lay and H. J. Taubenfeld, in one of their recent works, call for separate analysis of the problems concerning sovereignty /45
on celestial bodies and in outer space [57].

W. Jenks also wrote about this. In his words, outer space is not subject to appropriation by its very nature. Celestial bodies, for which the same principle is assumed, could be occupied if conditions and the development of technology would permit. The prohibition against their appropriation, concludes Jenks, is based primarily on considerations of international politics. He advocates applying the principle of nonappropriation, taking into account natural phenomena and the considerations of international politics. M. Marcoff, in any case (1964), also held that the legal nature of celestial bodies should not be "mixed up" with the legal nature of outer space [58].

Despite physical differences inherent in outer space and celestial bodies, we feel that there should not be a separate understanding of their legal nature. The specifics of celestial bodies must have significance only in the development of specific international agreements concerning the activity of nations on them.

The Hungarian lawyer G. Gal pointed out: the two most important aspects, namely exclusion of national appropriation and freedom of use, ensure identical regulation of outer space and celestial bodies, despite their special conditions and although they are different phenomena [59].

In the same definite way G. P. Zhukov states: "The legal regime of celestial bodies must not oppose the legal regime of outer space" [60].

Discussion of outer space and celestial bodies as a single object of study is very important in interpreting individual positions and wordings of the Treaty on Outer Space, in particular those in which the term "celestial body" is not used directly [61]. Standards of the 1967 Treaty, like the

propositions in UN General Assembly resolutions, all without exception mean outer space as well as the Moon and other celestial bodies it contains. The legal regime of celestial bodies is inseparable from that of outer space and any contradiction is erroneous. Not one of the propositions in the Treaty on Outer Space gives cause for limited interpretation of the sphere of application of the Treaty. The very name of the Treaty, as well as analysis of its text, points this out. In addition we feel that some sort of mutually penetrating process is possible. In our opinion, Paragraph 2, Article IV of the Treaty on Outer Space which prohibits the use of celestial bodies for military purposes must be extended to all outer space. Only then will it be possible to attain the goals proclaimed so solemnly by the Declaration of legal principles of the activity of nations in the exploration and use of outer space of 1963 and the Treaty on Outer Space of 1967. /46

Despite physical differences existing between outer space and celestial bodies, they are a single object of study of jurisprudence and the leading legal principles of the activity of nations in outer space or on any celestial body must be the same.

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Chapter II

LEGAL REGULATION OF THE ACTIVITIES OF NATIONS ON THE MOON AND PLANETS

/47

1. International law documents forming the basis for legal regulation of the activities of nations on the Moon and planets

Resolutions of the UN General Assembly. In discussing legal problems connected with the conquest of space, we constantly refer to a number of resolutions approved by the UN General Assembly and to principles, first mentioned there, which now form the basis of existing space law.

They are primarily resolutions 1721 (XVI) of 20 December 1961, 1802 (XVII) of 14 December 1962 and 1884 (XVIII) of 17 October 1963 as well as resolutions 1963 (XVIII) of 13 December 1963 and 2130 (XX) of 21 December 1965. A special place among these international documents is occupied by resolution 1962 (XVIII), known as the Declaration of legal principles of the activities of States in the exploration and use of outer space.

In accord with the UN Charter, resolutions of the General Assembly are exclusively recommendations and do not impose on UN members legal obligations (with the exception of those which are mandatory according to the Charter) [1]. Nevertheless, for a long time until the conclusion of the first international Outer Space Treaty in 1967, resolutions were the only international documents by which nations could be guided in the conduct of space activities and build cooperation between them. It is advisable briefly to analyze resolutions concerning legal principles regulating activities of states on the Moon and other celestial bodies.

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With the signing of the Treaty on Outer Space, principles first named in resolutions of the UN General Assembly became mandatory standards for States

parties to the treaty. The lawmaking, standard-forming process is taking place before our very eyes. "In the resolution of the UN General Assembly are formulated certain rules and standards of conduct for the nations. These are still not standards of international law but can later become such in the same way as ordinary standards of international law are formulated [2].

Resolutions of the General Assembly regarding outer space have been unanimously adopted, strengthening their value and emphasizing the international character of space activity. As G. I. Tunkin has pointed out, the international character of the act is of decisive importance in the formation of international standards. The unanimous adoption by UN members of resolution-recommendations signifies "the desire of nations that members of the organization act in accord with standards of the resolution " [3].

The unanimous adoption by UN member nations of resolutions which are international in character also assures later acceptance of the principles they contain as standards of space law.

The resolutions have not established new legal obligations. They have only suggested to states "for their guidance...the following principles" (resolution 1721 (XVI)) or as stated in resolution 1962 (XVIII), "solemnly" proclaimed that "in the exploration and use of outer space states must be guided by the following principles " [4].

Thus, "space" resolutions, reflecting the unanimous desire of nations to /49
be guided by the principles proclaimed in them and unanimously adopted, are placed a step above ordinary resolution-recommendations of the General Assembly. The US representative to the UN, in connection with the adoption of resolution 1721 (XVI), declared that the principles of the resolution are "the fundamental basis of the legal regime of outer space" and that "by the unanimous adoption of the resolution by the General Assembly, UN member nations had bound themselves with principles of extreme importance " [5]. In connection with the adoption by the General Assembly on 13 December 1963 of the Declaration of legal prin-

ciples, the representatives of a number of nations, including the USSR and the USA, declared their desire to observe the proclaimed principles of space law and be guided by them in the exploration and use of outer space and celestial bodies [6].

Resolutions accepted unanimously, as pointed out by G. I. Tunkin, can indicate the origin and formation of the new principles and standards of international law which are proclaimed in these resolutions. They can be "stages" not, however, concluding the process of standard formation which "can continue and be concluded by their recognition by nations as standards of international law " [7].

Resolutions of the UN General Assembly which have played an important role in the development of contractual standards of space law have been discussed in detail in Soviet literature [8].

These resolutions have introduced into practice a number of new legal concepts (for example, the concepts "celestial body," "peaceful use of outer space," etc.).

In the development of principles and standards of space law an important role has been played (in addition to the resolutions of the UN General Assembly) by two international documents banning testing and placing in space any objects with nuclear weapons or any other kinds of weapons of mass destruction — the Moscow Treaty banning tests of nuclear weapons in the atmosphere, outer space or under water of 5 August 1963 and the agreement between the USSR and the USA not to place in space objects with nuclear weapons, included in the resolution of the UN General Assembly 1884 (XVIII) of 17 October 1963. /50

Assuming that space law can be formulated only on a contractual basis, the Soviet Union, for purposes of exclusively peaceful exploration and use of space and celestial bodies, suggested in 1966 that at the XXI session of the UN General Assembly be discussed the question of concluding a broad international agreement which would establish strict law and order in this new sphere

of human activity. Thus, the principles proclaimed earlier in the resolutions of the UN General Assembly would be mandatory for all the parties signing. Such a treaty, in which the basic principles of space activities as a whole would be proclaimed, would lay the foundation for regulation of such activities.

The draft of a treaty also introduced by the USA to the UN in 1966 which concerned the activities of nations in the exploration of only the Moon and other celestial bodies was combined with an irresponsible aspect. The conclusion of a treaty whose sphere of action would be limited only to celestial bodies would at the same time mean that acute international law problems of activities in near space would not receive proper solution.

The Treaty on Outer Space of 1967. The signing in 1967 of the first international treaty on outer space was of great importance for the new branch of international law — space law. As pointed out by A. S. Piradov, "The Treaty established solid law and order in the new sphere of human activity — the peaceful exploration and use of outer space. It has become an important milestone in the struggle of peace-loving nations to turn outer space into an area of peace and international cooperation " [9].

The principles of the Treaty on Outer Space could also largely be extended to the activities of nations on celestial bodies. These principles can be summarized as follows: outer space is the common province of all mankind and its exploration and use shall be carried out for the benefit and in the interests of all states; the space activities of all states shall be based on equality; outer space shall be open and not subject to national appropriation; its exploration and use shall be in accord with international law in the interests of maintaining international peace and security; nations have international responsibility for activities in outer space; the exploration and use of outer space shall be in accord with principles of cooperation and mutual assistance with due regard to the interests of other nations. /51

The conclusion of the Treaty on Outer Space confirms the imperative need for progressive development of space law. The basic principles of space law,

contained in the resolutions of the UN General Assembly, despite complete respect by the nations, would have to be formulated as an international treaty to become mandatory for the parties.

Long before any human foot first stepped onto the surface of a celestial body, the Treaty on Outer Space had in general formulated the principle according to which this historic fact, before the event itself, received prior legal regulation. This prevented many misunderstandings which could arise in connection with unrealistic plans to explore celestial bodies, in particular, the Moon. Let us only recall the hullabaloo which arose in the USA at the time in connection with the sale and purchase of sections of the Moon. One enterprising businessman announced in the press: "I want to buy a Moon plot in order to exploit the minerals and natural resources there." [10]. The American millionaire E. Connelly was even more inventive. In his will he ordered that the sum of 25 thousand dollars be used to construct a family burial vault on the Moon. /52 [11].

We must also not fail to mention plans to use the Moon for agressive military purposes directed toward establishing a nation on Earth and in space. Pentagon officials quite recently came out with the wild idea of creating American military bases on the Moon and from there aiming a massive blow at Soviet cities [12].

The danger of such schemes was indicated by the Soviet representative to the UN, V. A. Zorin, at the First committee of the XIII UN General Assembly, 12 November 1958: "Control of outer space means control of the entire world, more certain and complete than any dominion which has ever been achieved or could be achieved with the aid of weapons, troops or occupation. Masters from outer space could control the weather on Earth indefinitely, cause droughts and floods, change tides and raise the sea level, divert the Gulf Stream and change a moderate climate to cold " [13].

To exclude such intentions and guarantee the use of outer space for the benefit and in the interests of mankind and exclusively for peaceful purposes,

it would be necessary to establish the principles proclaimed by resolutions of the UN General Assembly as a treaty. In January 1967 such a treaty — the Treaty on principles of the activities of nations in the exploration and use of outer space, including the Moon and other celestial bodies — was opened for signature. Its importance is that henceforth a solid legal base was created for the activities of nations in the peaceful conquest of outer space and celestial bodies. Signing of the Treaty by a majority of nations of the world undoubtedly helped transform the principles it contained into generally-accepted standards of international law and open up new possibilities for further regulation of the peaceful activities of nations in space.

As has already been indicated, the basic principles of the 1967 Treaty /53 are directly related to regulation of the activities of nations on the Moon and planets. What are these principles?

Prohibition of national appropriation. The principle of prohibition of national appropriation of outer space and celestial bodies, recorded in the Treaty, was first formulated by the UN General Assembly in resolution 1721 (XVI) and then confirmed in the Declaration of legal principles of the activities of states in the exploration and use of outer space [resolution 1962 (XVIII)].

The Treaty on Outer Space signaled the end of theoretical disputes concerning ownership of the Moon and refuted numerous concepts regarding the right to possess celestial bodies by transferring all rights to them to the United Nations and by establishing joint sovereignty over them of several states [14].

The Moon and other celestial bodies, according to Article II of the Treaty, are not subject to national appropriation by claim of sovereignty over them, by means of their use or occupation, or by any other means. Article II adopted the principle previously formulated by resolution 1721 (XVI): "Outer space and celestial bodies...are not subject to appropriation by states." The declaration of legal principles of the activities of nations in the exploration and

use of outer space in 1963 not only repeated this proposition, it significantly expanded and defined it more accurately, adding that such appropriation cannot be made "either by claiming sovereignty over it or by use or occupation, or any other means" (Para. 3 of the Declaration).

As not all nations have yet signed the Outer Space Treaty, the question arises of the imperativeness of the principles contained in resolutions of the UN General Assembly concerning celestial bodies. Although resolutions of the General Assembly as recommendations formally have no mandatory force for states, in this case "space" resolutions, and especially the Declaration of /54
legal principles, are the result of agreement between the majority of states, representing various legal schools. In other words, the states have clearly stated in resolutions their attitude toward these cardinal problems connected with the conquest of outer space and celestial bodies. No one nation, regardless of whether it is a party to the 1967 Treaty, has decided openly to make territorial claims to celestial bodies. Even former US representative to the UN Goldberg acknowledged that "no one nation can be permitted to declare that some part of a celestial body is subject exclusively to its national control " [15].

Thus, Article II of the Outer Space Treaty is a basic element in the creation of a legal regime for the Moon and other celestial bodies. However, despite approval of this standard both by states and by jurisprudence, although it is considered to flow logically from the principle "res communis," there are numerous different interpretations of it [16]. Western lawyers became especially active after samples of lunar soil were brought back to Earth.

The exact meaning of Article II can be more clearly understood in the light of the propositions contained in Article I of the Treaty. They can be reduced to the following: 1) the use of celestial bodies shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development and shall be the province of all mankind; 2) celestial bodies are free for use by all states with free access

to all their areas; 3) celestial bodies are free for scientific investigation and states shall encourage international cooperation in such investigations.

Summarizing these provisions, it can be asserted that all nations, irrespective of their level of scientific or economic development, are granted the right of free use of celestial bodies for the benefit and in the interests /55
of all mankind; however, national appropriation of them is forbidden. And no contradictions or "paradoxical position" arises here which the American lawyer E. Brooks perceived in Articles I and II. In support of his point of view he referred to the statement of the French representative to the UN Committee on Outer Space which reasoned that "the Sub-committee should decide how the principle of nonappropriation is compatible with effective exploration and use, as those resolutions which forbid appropriation of celestial bodies encourage their use " [17].

It is precisely for "effective exploration and use" of celestial bodies that a standard forbidding their appropriation by both individual nations or groups of nations and by individuals or companies is necessary. The effective use of the Moon could be a question if a state by its own forces and exclusively in its own interests began, for example, to develop its resources. If states agree that the legal nature of celestial bodies is res communis, then it is incomprehensible that arguments would arise concerning the contradiction between basic articles of the Outer Space Treaty.

The wording on national nonappropriation undoubtedly gave rise to the content of Article I, proclaiming that the use of celestial bodies "shall be carried out for the benefit and in the interests of all countries." In our opinion, the value of the standard in Article II is intensified by these propositions in Article I.

The words "interests of all countries" along with the declaration of the Moon and other celestial bodies as "the province of all mankind" also makes it necessary to reject extension of sovereignty of individual nations over them. It is clear that any privileges or advantages for one or several states

which would be created by the establishment of sovereignty over a celestial body or parts of it would inevitably infringe or on or even violate the interests of others.

Agreeing to the words prohibiting "national appropriation" of celestial bodies in whole or in part, some Western authors are attempting by some methods /56
or other to reserve advantages for certain nations. Some of these "methods" could be considered an attempt to justify the point of view according to which the UN, on behalf of broad cooperation, could acquire territories on celestial bodies. Thus, W. Jenks feels that prohibition of "national acquisition" applies to all forms of acquisition except that in the name of the UN. "Only in relation to possible acquisition by the UN in the name of broad cooperation as a whole can the question be considered open for the future " [18].

Affiliated with such expressions are concepts of internationalization of the Moon and other celestial bodies and the creation of an international agency within the framework of the UN to control celestial bodies. This agency was mentioned in the report of the Working Group on problems of the conquest of celestial bodies to the XI Colloquium on Space Law (October 1968).

The creation of a special international agency undoubtedly deserves serious discussion. The volume and scale of the expanding activities of states in the conquest of outer space, the Moon, Mars and Venus increases the urgency of establishing an international organization to guarantee conquest of other worlds exclusively for peaceful purposes, seeing to the interests of all mankind and coordinating forces of individual states.

In the opinion of Soviet authors, the idea of internationalization of all space activity, including that on celestial bodies, can by no means yet be considered mature.

The use of the Moon and other celestial bodies exclusively for peaceful purposes. Although resolutions of the UN proclaimed the exclusively peaceful

purposes of space explorations, agressive plans for the use of outer space have disturbed progressive society. This is why the statement and development of the question of the military aspect of space activity was opportune during preparation of the Outer Space Treaty of 1967.

Many representatives of legal science in the West, as we have already stated, have attempted to persuade world society that the concept of the realization of peaceful purposes in the exploration and use of space includes military measures without an agressive character. /57

Therefore, the ban on the creation of military bases, facilities and fortifications, testing of any type of weapons and the conduct of military maneuvers on celestial bodies is a great achievement in the matter of establishing a legal regime in which the exploration and use of the Moon and planets can be achieved actually only for peaceful purposes.

The content of Paragraph 2 of Article IV of the Outer Space Treaty provided a basis for several authors to speak of complete demilitarization of the Moon and other celestial bodies, as well as partial demilitarization of outer space. By complete demilitarization of outer space is meant a ban on activities pursuing military purposes in peace time; in case of partial demilitarization certain kinds of such activity, specified by international agreement, are strictly forbidden [19].

What is meant by demilitarization in the theory of international law, to the basic propositions of which space law, as derived from it, must of necessity correspond? By demilitarization the theory of international law means a regime of certain territories where "nations must, by international agreement and for the purposes of strengthening security, eliminate military fortifications and installations and not create armed forces " [20]. This means that although the prohibition in the Outer Space Treaty of activities on the Moon and other celestial bodies for military purposes is in general within the limits of this concept and does not contradict it, the accents and terminology in the Treaty differ.

The basis of the regime of use of the Moon and other celestial bodies /58
for peaceful purposes only was established in Article II of the Treaty. Here is indicated the obligation to conduct activities in the exploration and use of the Moon and other celestial bodies "in accord with international law, including the United Nations Charter, in the interests of maintaining international peace and security."

Therefore, it would, evidently, be advisable to speak of the prohibition of militarization of the Moon and other celestial bodies. In our opinion, this would more truly express the essence of Article IV of the Treaty and better correspond to the actual state of affairs. In international law, as is known, it is a matter of obligation to liquidate existing military fortifications and facilities. However, we cannot say that the erection of such facilities on celestial bodies and their use was already acknowledged in any international document and the Outer Space Treaty called for its revocation. Moreover, the word "militarization" is more accurate etymologically as it means "the creation of military economics during peace time for the purpose of preparing imperialistic troops against peace-loving countries, transfer of forms and methods of military organization to the area of civilian relations, the application of military rules and military discipline to any branch of the national economy, militarization of industry " [21].)

Thus, agreeing in principle with the understanding by the authors of Article IV of the Treaty, it is evidently preferable, nevertheless, to speak of a strict ban on militarization of the Moon and planets and of their use exclusively for peaceful purposes.

Prohibition of the use of the Moon and other celestial bodies to prepare for war is directly indicated in Paragraph 2 of Article IV of the Treaty. In our opinion, the establishment in Paragraph 1 of this Article of a partial ban on militarization of outer space is itself a shortcoming of the Treaty. A regime of complete prohibition of militarization must be applied to all outer space, based on the common interest of "all mankind in the progress of explora- /59
tion and use of outer space for peaceful purposes," proclaimed by the preamble

of the Treaty.

The second point of Article IV, containing a qualitatively new standard, is of a prohibitive nature. It forbids the establishment of military bases, installations and fortifications, tests of any type of weapons or the conduct of military maneuvers on celestial bodies. These special prohibitions are anticipated by the provision on the obligation of states which are parties to the Treaty to use the Moon and other celestial bodies "exclusively for peaceful purposes." These key standards have even greater importance than the noted prohibitions. Any measure leading to military application, for example, the use of navigation or communication systems, on the surface of the Moon for the purpose of war will contradict the Treaty. Article IV blocks any searches for loopholes in which military circles in the West are interested; they have not abandoned hope, despite the existence of the Treaty, that direct and definite indications might be evaded [22].

One of the propositions of Article IV which allows the use of military personnel for scientific research or any other peaceful purpose also, despite its criticism by many authors, by no means contradicts exploration and use of space exclusively for peaceful purposes.

Soviet lawyers correctly feel that the use of military personnel for scientific purposes or other such research in no way of itself contradicts the peaceful purposes of activities on celestial bodies. It is important that measures conducted by this personnel be carried out for peaceful purposes and not violate the propositions prohibiting militarization of the Moon and other celestial bodies. Evidently, the basis for such varied interpretation of the meaning of Article IV of the Treaty is its inadequately clear statement.

In order to remove this inadequacy of Article IV of the Treaty on Outer Space, which does not forbid the placing into outer space of any objects of /60
military intent or its use for military maneuvers and testing of any type of weapons of mass destruction, it is necessary to apply the principle of the prohibition of militarization to all outer space. As yet it is forbidden to

install such weapons only on celestial bodies. The Soviet draft of the lunar treaty tries to make up for this omission, specifying that nations must take upon themselves the obligation not to launch these types of weapons into orbit around the Moon; in other words — into outer space.

In connection with Article 51 of the UN Charter, which allows the right of self-defense in case of armed attack on a member of the UN, at one time a serious discussion raged in Western literature. Now they are writing about extended interpretation of Article 51 of the Charter, about applying it to activity in outer space and on celestial bodies [23]. Some lawyers justify the right to self-defense in space by appeals to the "traditional right to preventive self-defense," if there is threat of attack [24]. It is widely known, however, that the concept "threat of attack," interpreted in the sense of protection against a potential agressor, could in fact lead to the unleashing of war under the pretext of taking "preventive defense" measures.

The Italian lawyer R. Quadri has written about complete "freedom of arms" in space and the right to use it for military purposes; he felt that Article 51 of the UN Charter which forbids agression as such, including that from space, does not apply to the development of means which could be used for unleashing agression [25]. In other words, he fought for the right to use space for military purposes.

The demand for "freedom of arms" in space under the pretext of self-defense, like the right to take "preventive defense" measures, does not conform to the /61
meaning of Article 51 which allows the right to self-defense only "if armed attack occurs" against a state which is a party to the Treaty.

Soviet jurisprudence, believing in the principle of maintaining international peace and security, feels that in accord with Article 51, nations have the right to individual and collective self-defense in case of an armed attack, including one from celestial bodies [26].

The Outer Space Treaty does not directly mention such measures; however, according to the meaning of its Article III, in case of a breach of the principle of peaceful use of space, the Moon and planets or a direct threat to the existence or security of a state, i.e., in case of an illegal action, a state has the right to resort to self-defense measures "to maintain or restore international peace and security" (Article 51, UN Charter).

Propositions concerning the construction of stations on celestial bodies. The standard contained in Article II of the Treaty with regard to the prohibition of national appropriation of the Moon and other celestial bodies does not prevent, as admitted by the majority of lawyers, the future creation of scientific-research stations by nations, as well as settlements on the Moon, Mars or other planets in the solar system. This standard in no way contradicts the principle of the free access of states to all regions of celestial bodies; they have the right to choose any place for landing spacecraft or establishing a national scientific-research station. Each interested state can build not one, but several scientific-research stations, both manned and unmanned.

Analyzing the experience of international cooperation in the conquest of space, we can predict the inevitable creation on the Moon and other celestial bodies of joint stations and laboratories by several nations. Nations will coordinate experiments, consult among themselves and render mutual assistance.

Man living under extraterrestrial conditions will inevitably cause a number of complicated problems, including that of regulating measures to protect the life and health of personnel manning scientific stations on planets. /62

In establishing space stations, states must fulfill the requirements of Article IX of the Outer Space Treaty. It obliges nations to conduct activities on celestial bodies "with due regard to the corresponding interests of all other states." In turn, Article I of the Treaty obliges states not to prevent free access to all areas of celestial bodies.

Thus, the right to construct stations on celestial bodies is based on the Outer Space Treaty which defines the basic principles of activities of these stations. Because of Articles I and III, standards of international law, including the UN Charter, are extended to the activities of these scientific stations. In solving problems which arise, the Treaty calls for being guided by the principle of broad international cooperation in the interests of maintaining international peace and security.

The foundations of the legal regime of such stations are defined in Article VIII of the Treaty. A state "in whose register is recorded an object launched into outer space" shall retain jurisdiction and control over it "during the time" it is on a celestial body; proprietary rights over objects sent to a celestial body or constructed on it and over its components "shall remain unaffected during the time it is on" a celestial body.

This Article has caused some authors to recall situations arising on ships and airplanes. W. Jenks noted that on celestial stations all events must submit to the law of the nation of registration, in the same way as the flag nation has authority on a ship. Disciplinary authority over spacecraft and stations is the same as that of a captain of a ship or the commander of an airplane crew [27]. Other authors suggest turning to the example of national stations in Antarctica, considering them as an "encouraging precedent" [28]. The Hungarian lawyer G. Gal notes that in both cases equipment and personnel are in territories excluded from the sphere of national sovereignty; /63
what these analogies confirm is: stations built on the Moon or other celestial bodies do not destroy the character of res communis omnium of celestial bodies or the principle of their nonappropriation. G. Gal draws a further analogy with the status of a ship in the open sea. The captain of a ship, in the opinion of the Hungarian lawyer, has jurisdiction in the area around his ship (for example, to prevent a collision). These functions of a ship's captain of themselves do not create a regime of territorial waters around the ship; analogously, jurisdiction over a station does not mean the establishment of sovereignty over that area of a celestial body used as a station [29].

Effective functioning of a scientific-research station on a celestial body evidently will require a certain area around the station itself (for example, to store equipment, necessary supplies, etc.). Jurisdictional rights of the nation which has constructed the station are extended to this territory. It appears that practical demands necessitate the existence of such a zone and with observance of the general propositions of the Treaty will not contradict it.

The Treaty on Outer Space failed to discuss one other question: placing a space object or station into orbit around a celestial body. In our opinion, propositions concerning celestial bodies must be applied to such objects and stations as they undoubtedly will be more closely connected with the celestial body in whose orbit they are rotating than with the Earth.

In connection with the problem of the legal status of national stations on celestial bodies there is interest in the report of the American lawyer J. R. Tamm which he presented to the XI Colloquium on Space Law [30]. He notes that the clear and distinct propositions of Article VIII are somewhat complicated by the words "shall remain unaffected during the time they are on...a celestial body." And what if, he asks, a station is built exclusively of materials found on the celestial body? Does this station belong to the nation which built it (or some physical or legal individuals) or in light of the fact that the material is found on the celestial body, does Article II of the Treaty come into operation, preventing the establishment of proprietary rights of an individual nation over celestial bodies? J.R. Tamm does not answer this question, assuming that definition of the legal status of national stations on celestial bodies requires further interpretation of corresponding propositions of the Outer Space Treaty as well as mutual consultations. His general conclusion is that a national station located on a celestial body cannot have any legal status other than the national proprietor establishing it. /64

A special aspect of the legal status of stations built on celestial bodies is noted in Article XII of the Treaty on Outer Space. "All stations, installations, equipment or spacecraft on the Moon and on other celestial bodies

shall be open to representatives of other States parties to this Treaty on the basis of reciprocity..." We note that reciprocity is promoted as a necessary condition of possible visitation of a station by representatives of other nations. "These representatives," it states further in Article XII, "shall report their planned visit in advance in order that appropriate consultations may be conducted and maximum precautionary measures taken to ensure safety and avoid interruption of normal operations at the installation being visited." In other words, a nation whose representatives desire to visit a station cannot independently, unilaterally determine the time and circumstances of such a visit, regardless of the standard in Article I of the Treaty concerning free access for all nations to all areas of celestial bodies. The Treaty grants the right to visit stations only under these conditions.

Article XII was the result of a compromise reached during discussion of drafts of the Treaty. The USA suggested establishing the complete, unconditional right of all nations conducting activities on celestial bodies to visit stations at any time [31]. This suggestion could not be accepted by nations interested in ensuring the mutual interests of all countries. Besides everything else, a visit not specified beforehand to a station could disturb a scientific experiment or, what is more, cause dangerous consequences for the visitors. /65

At the present time, when no manned scientific-research stations are yet in operation on the Moon or any other celestial bodies, the proposition in Article XII might seem unreal. This, however, is not true. The creation of such stations is not far distant. And then, especially if there are neighboring stations established by different nations on the same celestial body, detailed legal regulation of their activities will be required. Let us also note that mutual visits will, undoubtedly, promote international cooperation between nations in the exploration and use of celestial bodies. They will open up new possibilities for such investigations.

Of great interest is the problem of mutual relations and cooperation between personnel of neighboring stations. And this aspect must be reflected in

future agreements proceeding in greater detail from the Treaty on Outer Space.

Article V of the Treaty established the obligation of states to inform each other about "established" phenomena which "could endanger the life or health of cosmonauts." Undoubtedly, if personnel of one station ascertain such phenomena they will be bound, according to Article V, to report them to other stations. Just as according to Article IX of the Treaty no national station shall have the right to conduct explorations or experiments which create "potentially dangerous obstacles to the activities of other nations."

The Treaty on Outer Space, therefore, created general prerequisites for the development of more detailed and specific propositions which could constitute the legal status of scientific and other activities of nations on celestial bodies. It is important to note that each celestial body has /66 characteristics requiring a different approach.

The creation of scientific research stations and their practical activities will inevitably give rise to numerous specific legal questions which the Treaty is unable to answer. Questions arise connected with prolonged occupation of stations, with the effect of civil, labor and criminal standards in relation to activities on celestial bodies, etc. Lawyers consider especially complicated the problem of the exploitation of natural resources of celestial bodies not only for scientific purposes, but also for commercial use. It can be agreed that "as man penetrates into space and uses new technology, problems facing lawyers will not become less complex or less controversial. Joint international forces must be continued in order to solve problems connected with man's penetration into outer space " [32].

Problems of the use of natural resources of celestial bodies. The unprecedented rates of development of astronautics make it safe to say that future activities of man in the conquest of celestial bodies will not be limited only to scientific purposes. Man, enriched by knowledge, will finally learn to use extraterrestrial resources for his own benefit. Having discovered on celestial bodies substances previously unknown on Earth with a high degree of

practical application, man will, undoubtedly, in time learn to use them for earthly needs.

"With the development of astronautics," wrote one of the first Soviet researchers of social and economic factors involved with the conquest of space, A. D. Ursul, "direct geological prospecting on the Moon, planets and their satellites will become possible. Geological explorations on the Moon, for example, will to a significant degree make it possible to choose between the two competing theories of the origin of oil and aid also in the geological prediction of other Earth minerals " [33].

If we are guided by the principle of freedom of the use of the Moon and other celestial bodies, then any necessary facilities and equipment can freely be established on celestial bodies. Materials found there can freely be used for construction or other purposes necessary to support life there. /67

Does the Outer Space Treaty specify the order of use of natural resources of the Moon and other celestial bodies? On the whole the Treaty left this question open [34].

There is no doubt that the problem of the conquest of natural resources of celestial bodies requires serious discussion, possibly at the international level by both lawyers and specialists of various branches of learning.

When, in the distant future, natural resources of the Moon and other celestial bodies begin to be used for purposes extending beyond the limits of purely scientific research, legal problems connected with the exploitation of natural resources of celestial bodies will have to be solved. It will also, evidently, be necessary to solve the matter of creating definite zones or sections to ensure effective function of the station and all its installations and relaxation for personnel. It will also probably be advisable to assign such zones for a certain period of time, and in case of misuse or activities conducted for purposes not in accord with the Outer Space Treaty or other international agreements, to revoke the decision concerning assignment of this zone.

The problem of natural resources of celestial bodies was discussed in considerable detail at the XII Colloquium on Space Law. Several speakers (especially lawyers from Argentina) called for preparation in the near future of an international agreement regarding exploitation of natural resources of /68
the Moon and other celestial bodies and for the creation of a corresponding international organization or agency to regulate exploitation of these resources [35].

The statements of the Argentine authors are no accident. In June 1970 during the IX session of the Legal Sub-committee of the UN Committee on Outer Space, Argentina introduced the draft of an international agreement on principles regulating activities in the use of natural resources of the Moon and other celestial bodies [36]. The draft consists of a preamble and five basic Articles. Article 1 declares natural resources of the Moon and other celestial bodies as "the common heritage of all mankind." In accord with Article 2 "all materials originating on the Moon or other celestial bodies are considered natural resources." Article 3 specifies that benefits derived from the use of these natural resources shall be granted to all nations without any kind of discrimination.

These Articles of the draft were worded extremely vaguely. Numerous perplexing questions arise: by whom and how should the question of the origin of materials extracted from a celestial body be decided, who shall distribute the benefits "derived" and how is discrimination to be avoided?

There is no doubt about the necessity and advisability of detailed legal regulation of the problem of natural resources of celestial bodies. However, at the same time, the entire complex of questions concerning varied activities of nations on celestial bodies must be solved and not only that of the use of natural resources.

From the very start, resources of celestial bodies must be placed under reliable international protection. As is known, the richest reserves of natural resources could be depleted by irrational or predatory use. It is already

necessary to take care that future generations not "inherit" the Moon and planets in a deteriorated state. /69

No less important for future generations will be the duty to protect any forms of life on celestial bodies.

Today the idea of a plurality of inhabited worlds is a real hypothesis; not proved, but completely probable. Scientists conjecture that even in our galaxy there are millions of planets on which life exists and over 100 billion stars in this giant galaxy. The sterilization of objects launched into space and a solicitous attitude toward the cosmic medium must, undoubtedly, receive necessary legal resolution. G. Gal has indeed written that "legal relations with space beings is still an Utopian question" and that a generation which will live a hundred or a thousand years from now will overlook the jurisprudence of the 20th century, being concerned with more important practical matters of its own era. [37]. However, these problems, although in general form, must be given attention.

Rendering aid, mutual assistance and rescue in case of accident, disaster or forced landing on celestial bodies. If cosmonauts launched into outer space or a celestial body find themselves in a difficult, to say nothing of an accident situation, everything possible shall be done to save them. The state which launched them, if it is impossible to help them with their own forces, shall turn for help to another state able to undertake measures to save the men. It can be no other way. The authors of the Declaration of legal principles of 1963, and then the Treaty on Outer Space of 1967, formulated the concept of cosmonauts [38] as "ambassadors of mankind in space." These words emphasize the common human, international character of "space missions." And it is not a matter of creating any kind of special diplomatic status for cosmonauts, but of respect and the willingness of any nation, if need be, to come to their aid. /70

In view of the fact that cosmonauts in outer space, and all the more on celestial bodies, are on guard at each step for a thousand surprises, space-

craft are provided with an abort system, intended to save the crew in case of accidents during any part of the active trajectory. Corresponding means of safety are also needed for cosmonauts when on the Moon or other celestial bodies.

The question of mutual assistance in rescuing cosmonauts in disastrous situations has become the object of international cooperation between the two leading space powers. In particular, one of the basic purposes of Soviet-American negotiations regarding unified docking procedures of space systems is rendering aid to cosmonauts in orbit.

The principle of rendering aid to cosmonauts, formulated in the Treaty on Outer Space, is closely connected with another important principle of the Treaty — the principle of international cooperation. And however natural and understandable the propositions on rendering aid and rescuing cosmonauts seem, they would remain empty phrases if states do not proceed from the principle of the broadest international cooperation. This is especially so as in rescue operations nations can encounter numerous complicated problems [39]. Thus, in rendering aid to personnel of neighboring stations on the Moon the problem of sudden arrival at the station can arise. As is known, a visit to a neighboring station, in accordance with the Outer Space Treaty, must be by prior arrangement. Therefore, it is necessary to specify a proposition by which, in case of accident, cosmonauts would have the right to approach a neighboring station and not thereby violate the propositions of the Outer Space Treaty. Other complications connected with the legal regulation of activities in rendering aid to cosmonauts are also possible.

Article V of the Outer Space Treaty regulates questions of rendering aid /71
and mutual assistance in general form. In particular it states that nations shall render "all possible assistance in case of accident, disaster or forced landing."

Undoubtedly the Treaty on Outer Space proceeds from the need to protect persons risking health and life in the name of human progress. This was clear

from the very start of space activity. Moreover, standards of international maritime and air law concerning the rendering of all possible assistance to sea and aircraft in disaster situations were used as models [40].

In the Declaration of legal principles of 1963 this proposition in general form was isolated in a separate point (Paragraph 9). Then it was included verbatim in Article V of the Outer Space Treaty and thus changed from a moral obligation to a legal standard, mandatory for States parties to the Treaty. In Article V is formulated a proposition referring most directly to activities on celestial bodies. In Paragraph 2 of Article V it is stated: "In conducting activities in outer space, including celestial bodies, cosmonauts of one State party to the Treaty shall render all possible assistance to cosmonauts of other States parties to the Treaty."

Then follows the proposition that nations inform each other, as well as the General Secretary of the UN, of those phenomena in outer space, including the Moon and other celestial bodies, "which could present a danger to the life or health of cosmonauts" (Paragraph 3, Article V). It must be noted that the duty of states to inform each other of all phenomena occurring on celestial bodies will certainly be of great importance when several scientific stations are in existence. Under such conditions mutual assistance will now and then be /72
more important than that on Earth.

The Treaty in general form, therefore, provides for the conduct of measures to render assistance in case of accident on celestial bodies as well as for mutual reporting of all noted phenomena on the celestial body.

In the Declaration of 1962 (XVIII) the question of rendering mutual assistance was not discussed. However, the development of space activities made it necessary to include the point on rendering mutual assistance in the Treaty of 1967. Undoubtedly, as conquest of celestial bodies continues, the problem of rendering assistance by spacecraft crews and personnel of neighboring celestial stations to each other will acquire even greater importance and require additional special and more detailed regulation.

In the resolution of the UN General Assembly on international cooperation in the use of outer space for peaceful purposes of 1963 (XVIII), a suggestion was made to the UN Committee on Outer Space to prepare an international agreement on cosmonaut assistance. In 1964 the Soviet Union presented its draft of such an agreement to the Legal Sub-committee of the Committee on Outer Space. The USA introduced its draft; corrections and additions were made by Australia, Canada and other countries. On 22 April 1968 the text of the Agreement on the rescue of cosmonauts, the return of cosmonauts and the return of objects lost in outer space was solemnly opened for signature. Propositions of the Agreement develop and concretize obligations established in Article V of the Treaty on Outer Space regarding the rendering of assistance and the rescue of cosmonauts.

In the preamble of the Agreement it is noted that the nations are concluding a new document based on feelings of humanity and that they desire to promote international cooperation in the peaceful exploration and use of outer space.

The principle of international cooperation which is discussed in all international documents and invoked in the regulation of the exploration of outer space and celestial bodies, is of paramount importance in rendering assistance to cosmonauts and their rescue. Mutual assistance in general is inconceivable /73
if in their relations nations are not guided by this important principle. It is no accident that the draft of resolution III of the Working Group of the International Institute of Space Law regarding the status of celestial bodies (1966) indicated that on a celestial body, relations between crew members of spacecraft of different nations must be regulated by general principles of humanity, assistance and neighborliness.

Let us note in passing that the Agreement on rescue indicated that aid shall be rendered to "crew members of a spacecraft." Taking into consideration the present level of achievement in the exploration of celestial bodies, and that in time permanent scientific-research stations will be created there, evidently it is necessary to assume that the category of persons to whom

nations are obliged to render assistance will also include any crew member of a space station. There is no doubt, for example, that any man in any capacity regardless of the length of his stay on the Moon or his position on it, must have full guarantee that his health and life are being protected, that he is not threatened by any danger due to activities of other investigators of the Moon or its environs. The rescue obligations imposed by the Agreement on States parties in relation to the duty to report disasters and in such case to render all possible aid must, undoubtedly, also be extended to personnel of future scientific-research stations.

Regulation of this important area in space law cannot be limited only to the Agreement of 1968. Evidently, other bilateral and multilateral agreements will be worked out, based on the principle of international cooperation which will ensure the practical safety of cosmonauts. The draft of the lunar treaty presented to the UN by the Soviet Union in June 1971 contains a special proposition on the obligation of nations to take all possible measures to protect the life and health of a man on the Moon.

Thus, being guided by the principle of international cooperation, which underlies the Treaty on Outer Space, states are bound in all cases of accident or other disaster to render assistance to cosmonauts of other nations and /74
with all possible means to further the success of rescue operations. It can be assumed that when celestial stations are in operation, personnel of one will, if necessary, make it possible for persons from another station to take shelter in their installations.

All these legal commitments, however, would be dead letters if they were not reinforced by appropriate technical means. Differences now existing in spacecraft and equipment systems could make mutual assistance impossible between cosmonauts of different nations. Necessary are standardization of space equipment and compatibility between approaching and docking space equipment.

These urgent demands, in particular, are being met by Soviet-American cooperation in the field of space. Since October 1970 these problems have been

discussed regularly in meetings of Soviet and American specialists conducted alternately in the Soviet Union and the USA.

On 24 May 1972, during the state visit of the US president Richard Nixon to the Soviet Union, the Soviet-American Agreement on cooperation in the exploration and use of outer space for peaceful purposes was signed. The parties, in particular, agreed to conduct experiments to create necessary means to dock Soviet and American spacecraft and stations. In the summer of 1975 is planned the first joint experiment in docking manned spacecraft with the mutual transfer of cosmonauts from one craft to the other.

We must mention that the Soviet Union, true to the idea of international cooperation and mutual assistance, in carrying out the propositions of the Treaty on Outer Space of 1967 and the Agreement on the rescue of cosmonauts of 1968, did everything possible during the emergency situation created on the American spacecraft "Apollo 13." By direction of the Soviet government several Soviet ships were given orders to change course and head for the splash down site to render possible aid to the astronauts. The US president expressed deep gratitude for the offer of the Soviet Union to render aid to American astronauts in trouble, considering this as an example of international cooperation and practical realization of the Agreement on rescue of cosmonauts of 1968. /75 This Agreement, therefore, significantly increased the reliability of rescue operations in space. Joint docking systems in spacecraft will also open the way toward realization of the most daring space projects which the Soviet Union and the USA could undertake.

The prevention of potentially dangerous consequences of experiments in connection with the exploration and use of celestial bodies. One of the difficulties of investigating celestial bodies is their inevitable contamination. Each space device which makes a soft landing on the Moon carries into the lunar "atmosphere" some amount of foreign gases. This process will accompany conquest of the Moon and other celestial bodies; biological contamination will present an especial danger. The aim of the scientist is to make it the least harmful. Therefore, in the interests of science, experiments must be prevented which

could have potentially harmful results and therby essentially disturb the natural state of celestial bodies and their environs.

The problem of preventing damage to the natural state of celestial bodies and their environs is part of the broader problem of preventing contamination and pollution of outer space and celestial bodies. Our purpose includes discussing questions directly concerning the prevention of potentially harmful consequences of experiments in connection with the exploration and use of celestial bodies. It is one of the most urgent problems. Future study of celestial bodies will largely depend on its correct resolution.

The problem of preventing the contamination and pollution of celestial bodies encompasses the prevention of biological, radioactive and chemical contamination of celestial bodies, as well as the exclusion of such experiments on celestial bodies which are dangerous for the life and health of cosmonauts. This will be especially important in the establishment of permanent manned stations on celestial bodies. Research in one scientific station must be conducted so that it does not cause harmful contamination in the area of the station or potentially harmful consequences for activities of other stations. /76
Important here are measures to sterilize both objects launched to the Moon and other celestial bodies and those returning to Earth. Bringing microorganisms to any celestial body could disturb the balance established there and cause irreparable consequences.

What is to be understood by contamination and pollution of celestial bodies; to what can potentially harmful experiments lead?

G. P. Zhukov, by potentially harmful consequences of experiments in space, means those consequences resulting from actions able to damage the investigation and use of outer space for peaceful purposes or the interests of all mankind. Here he also includes experiments able to "cause changes in the natural environment of the Earth, celestial bodies or outer space...which can damage future scientific studies and tests, as well as the interests of other nations and human living conditions." [41].

The American lawyer E. Hayley has written about the potentially harmful consequences of experiments in space: "...the problem of interplanetary contamination exceeds the bounds of maintaining ideal conditions for scientific research and also concerns conserving or at least controlling exploitation of natural resources of planets in the solar system and protecting other life systems " [42]. E. Hayley did not limit himself only to the interests of science, requiring conditions on celestial bodies to be preserved in their primitive form. He was also concerned about establishing control of the "exploitation of natural resources of planets." In our opinion, serious disturbance of the natural state of celestial bodies can in general eliminate such exploitation.

Well thought out, conscious changes in the natural environment of celestial bodies, which are necessary in the interests of providing human "living" conditions, is a special problem. If the question arises of conducting such /77
measures, international consultations and preliminary experiments will be necessary in order to prevent possible harmful consequences. In all cases the principles of broad international cooperation and mutual understanding must also be regarded as of paramount importance.

The problem of preventing potentially dangerous consequences of experiments faced scientists even in the initial period of exploration of celestial bodies. Questions of pollution and the necessity of developing an international code for preventing interplanetary contamination have been widely discussed within the International Astronautical Federation (IAF), created in 1951.

From the first launches of objects into outer space the IAF has performed the function of coordinator of the activities of states in order to prevent interplanetary contamination.

In 1959 at its X Congress the IAF discussed in detail the question of the sterilization of space apparatus to prevent extraterrestrial biological contamination. In 1960 the Federation created the International Institute of

Space Law; its V Working Group was commissioned to study the character and rules themselves regulating measures to prevent contamination of the Earth and celestial bodies. However, the IAF is a non-governmental organization and its resources with regard to the recommendations are extremely limited.

In 1961 and then in 1963 there arose an extensive alarming discussion among scientists and lawyers all over the world concerning the conduct of experiments in the US to disperse into space 350 million fine copper needles (dipoles) in connection with the "West-Ford" project.

The British Davis Institute for the study of international problems at that time suggested that an international convention be concluded on the prevention of experiments which could disturb the balance of nature and contaminate outer space and celestial bodies with devices launched from Earth.

Maintaining the balance of nature is an extremely complicated and serious problem. It is especially acute in connection with prospective intentional effects on weather and climate of the Earth. Scientists fear that a change in /78
weather conditions in one location could cause catastrophic harm in another. In planning any kind of change in climate conditions it is necessary to keep in mind this extremely serious situation. Therefore, before experiments are undertaken to make large-scale changes in the weather and climate, all possible and desirable consequences must be carefully evaluated. In addition, even if a change in climate will have a favorable effect, this will inevitably entail different kinds of ecological changes in the life of man, plants and animals, i.e., any interference in the environment can disturb the balance in which man and other kinds of life exist. Such scientific experiments can also cause unintentional harm in relation to the "climate" of celestial bodies.

In 1962 in the first report of the World Meteorological Organization on progress in the development of atmospheric sciences and their practical application in the light of achievements in the field of exploration of outer space, the necessity was indicated of careful planning and evaluation of the conse-

quences which man could cause by large-scale disturbance of the climatic balance [43].

Problems of preventing potentially harmful consequences of experiments in outer space were of interest to the Committee on contamination resulting from extraterrestrial exploration SETEKS, created in March, 1958, by the International Council of Scientific Unions. The Committee adopted a document calling for the most rapid development of an international code to prevent the danger of contamination as the result of space research.

In March, 1959, SETEKS transferred its authority to the International Committee on the exploration of outer space (COSPAR) [44].

The UN Committee on Outer Space also at one time discussed the problems /79
of the contamination of outer space by substances introduced from Earth. For the purpose of preventing pollution of space, a study of corresponding problems was authorized to work out legal standards. However, these standards were not adopted because the Committee considered contamination a legal problem not requiring immediate solution at that time [45].

Dangers connected with the exploration of outer space and celestial bodies are a primary threat to cosmonauts. In conducting any kind of experiments in space and on celestial bodies, the question of avoiding consequences dangerous for the life and health of cosmonauts should take first place. These experiments can be fraught with the danger of biological, radioactive or chemical contamination of celestial bodies. Nations launching space objects to celestial bodies or in the direction of celestial bodies must take appropriate precautionary measures against such contamination. The question is what kind of legal regulation of space activity should there be, what can cause contamination and pollution of celestial bodies and thereby expose the life of cosmonauts to danger.

In the 1960's nations undertook a number of practical measures to regulate the contamination and pollution of outer space. Of great importance in the

prevention of contamination of space with radioactive products was the Treaty banning tests of nuclear weapons in the atmosphere, outer space or under water, signed 5 August 1963, and the agreement between the USSR and the USA not to place into orbit space objects carrying nuclear weapons or other kinds of weapons of mass destruction, approved as a resolution of the UN General Assembly on 17 October 1963.

A serious danger is presented primarily by nuclear tests in outer space. Products of radioactive decay in near space do not bombard the surface of the Earth immediately but gradually, over decades, increasing the radiation background. As the result of nuclear experiments, besides natural radiation belts, artificial radiation belts develop which increase the danger for space flights. Products of radioactive decay can fall on celestial bodies and cause a change in natural conditions. /80

Radiation can also originate from a radio equipment power source installed in a space object or on the surface of a celestial body. In connection with the prospects for use of nuclear equipment in space objects as rocket motors and energy sources the necessity arises of specially developing measures to prevent the possibility of contamination from them.

The use of new scientific advances in space research requires great care as destructive, undesirable consequences of a particular experiment can arise as the result of malfunctions which can irreparably contaminate outer space and celestial bodies.

On 21 April 1964, during an unsuccessful launch, an American navigational satellite failed to go into orbit and burned up in dense layers of the atmosphere. The "SNEP-9a" radioisotope unit, operating on plutonium-238, exploded. The cloud of fine particles of radioactive substances which formed placed a large area of the Earth under the threat of contamination.

Directly related to the problem of potentially harmful consequences of experiments in space are the barbarian plans for so-called geophysical war,

causing legitimate anxiety for the fate of the world, i.e., attacking the composition of the earth's atmosphere. One scientist conducting a study to create new kinds of weapons has written: "If a crack could be made in the ozone layer surrounding the Earth, then underlying territory would be exposed to the deadly effect of ultraviolet solar rays " [46]. As is known, ozone forms under the effect of solar radiation in upper layers of the atmosphere and absorbs a large amount of ultraviolet rays, which are destructive to all life. /81

The desire to extract maximum benefits from the achievements of science leads scientists of a certain inclination to create newer kinds of weapons with more terrible consequences which are tested in secret and masked in every possible way.

In view of all this, by pollution and contamination of outer space and celestial bodies is meant any actions, intentional or unintential, which can cause a change in the natural environment of the Earth, outer space or celestial bodies, thereby doing damage to the interests of science or threatening life on Earth or on celestial bodies where such exists.

Scientific experiments of a potentially harmful character must be placed under the most strict control, widely discussed in advance by all interested nations and conducted only after international consultations with strict observance of all necessary precautionary measures.

The Institute of International Law in Brussels and the British Davis Institute for the study of international problems consider the conduct of experiments with harmful consequences as damaging to the interests of all mankind. The British Institute suggested establishing various sanctions to prevent contamination and pollution of space. "The conclusion of a convention on this matter will be as necessary as that on the prevention of biological, radiation and chemical contamination of outer space and celestial bodies by devices launched from Earth and vice versa," wrote E. Pepen on this subject [47].

In Paragraph 6 of the Declaration of legal principles of the activities of states in the exploration and use of outer space the following principle is stated: "In the exploration and use of outer space states shall be guided by the principle of cooperation and mutual assistance and shall conduct all activities in outer space with due regard to the corresponding interests of other states. If any state has basis for thinking that space activities or an experiment planned by this state or citizens of this state will create potentially harmful obstances to the activities of other states in the peaceful exploration and use of outer space, then it shall conduct appropriate international consultations before embarking on such activities or experiments..." [48]. /82

The Declaration, however, does not answer questions on how, when and with whom these consultations are to be conducted, whether immediately before the experiment or long before, to what degree states must take into consideration the recommendations of international consultations, etc. Nevertheless, proclamation of this proposition was very important for further legal regulation of this aspect of space activity.

The UN Committee on Outer Space, on the basis of recommendations of its Scientific and Technical Sub-committee, presented to the XX Session of the UN General Assembly a report, after discussion of which the latter adopted Resolution 2130 (XX) on 21 December 1965, having approved the recommendations of the Scientific and Technical Sub-committee regarding the prevention of experiments with potentially harmful consequences. The Sub-committee, in particular, recommended questioning the Consultative Group of COSPAR "with regard to scientific analyses of qualitative and quantitative aspects of proposed experiments and carefully studying the results of these analyses." The Committee also suggested that COSPAR report to the UN Committee on Outer Space the results of analyses conducted by the Consultative Group. This procedure, emphasized in the report, will not prevent international consultations specified by the Declaration.

Among other principles of space law, preventing potentially harmful consequences of experiments in outer space and on celestial bodies occupies a special

place. The principle of freedom of exploration and use of outer space and /83
celestial bodies, established by the Treaty on Outer Space of 1967, does not give some states the right to act to the detriment of others. According to Article IX of the Treaty "in the exploration and use of outer space, including the Moon and other celestial bodies, States parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct their activities in outer space, including the Moon and other celestial bodies, with due regard to the corresponding interests of all other States parties to the Treaty. States parties to the Treaty shall conduct investigation and exploration of outer space, including the Moon and other celestial bodies, in such a way as to avoid their harmful pollution as well as unfavorable changes in the Earth's environment by the introduction of extraterrestrial substances and shall for this purpose, when necessary, take appropriate measures."

The Treaty, thus, acknowledges that in the process of further conquest of outer space and celestial bodies situations can arise which require taking special measures. Determination of the definition of "appropriate measures" requires their concretion. The development of measures to prevent potentially dangerous consequences of experiments conducted, in particular, on celestial bodies must involve specialists in a great variety of fields: biology, physics, medicine, geology, meteorology and representatives of many other branches of learning. Evidently, we must also assume that standards to prevent dangerous consequences of space activities will be extended to the exploitation of natural resources of the Moon and planets, as the proposition on national responsibility for harmful pollution and unfavorable changes in the Earth's environment still applies only to the exploration of outer space and celestial bodies.

International responsibility of states for national activity on celestial bodies, including damage caused by space objects. International law responsibility for the activities of states on celestial bodies is, undoubtedly, part /84
of the general problem of responsibility for any activity in the exploration and use of outer space.

As the scales of space activities become complicated and expanded, the problem of responsibility for national activities in space and on celestial bodies, as well as for damage caused by space objects, will take on ever increasing practical importance and urgency. In particular, with the increased number of objects launched into outer space, the possibility of damage caused by such objects to the Earth, in airspace and in outer space itself, will increase correspondingly. Later, in proportion to how activities on the Moon will be expanded, a great deal of attention will also be demanded by questions of responsibility for possible damage resulting from such activity.

From the very beginning of space activity, in solving the problem of responsibility, two points of view have been expressed: adherents of the first have considered a state alone to have such responsibility; adherents of the second have felt it is possible to tolerate activities in space, also with the understanding of bearing of responsibility by privately-owned enterprises as well as states. It is clear that proponents of the second point of view reflect the interests of capitalistic monopolies and their expansionist tendencies. It is important not to allow space to be turned into a field of battle between competing capitalistic monopolies.

Article VI of the Outer Space Treaty of 1967 in general form regulates international law responsibility for national activities in outer space, including the Moon and other celestial bodies. Article VI reads: "States parties to the Treaty shall have international responsibility for national activities in outer space, including the Moon and other celestial bodies, irrespective of whether it is conducted by governmental agencies or non-governmental legal individuals, and for ensuring that national activities are conducted in accordance with propositions contained in this Treaty..." In the case of space activities by international organizations the state is also responsible, according to Article VI; but the international organization is not free of responsibility and shares it with the States parties. /85

Such wording of Article VI corresponds to the position of the Soviet Union and other socialistic countries. Placing responsibility on a state

for any activity in outer space or on celestial bodies, including international organizations, in no way prevents such organizations from conducting investigations. In the interests of international cooperation it is necessary that space activities connected with serious risk and huge national expenditures be directed and regulated by that nation.

Accepting the principle of national responsibility in whatever form was of great importance for regulation of the matter.

The principle of responsibility of states for national activities in outer space and on celestial bodies includes responsibility for damage caused by space objects. In the course of preparing the Outer Space Treaty, the states agreed to compensate any damage resulting from activities connected with high-danger sources, such as exist in outer space. This proposition was included in Article VII of the Treaty which specifies that "each state ... which undertakes or organizes the launch of an object into outer space, including the Moon and other celestial bodies, as well as any nation from whose territory an object is launched, bears international responsibility for damage caused by such objects or their components on Earth, in airspace or outer space, including the Moon and other celestial bodies, to any other state...its physical or legal persons." The above resolution corresponded to Paragraph 5 of the Declaration of legal principles of the activities of nations in the exploration and use of outer space of 1963.

Neither the Declaration nor the Treaty, as can be seen, regulates problems of responsibility in detail. It is the general conviction that these questions must be solved in a special international convention. Drafts of /86
such international conventions have been presented by Hungary, the USA, Belgium, India and Italy for consideration of the Legal Sub-committee of the UN Committee on Outer Space since 1964.

On 29 November 1971, after long years of discussion in the Legal Sub-committee, the XXVI session of the UN General Assembly approved the Convention on international responsibility for damage caused by space objects. On

29 March 1972 the Convention on international responsibility for damage caused by space objects was simultaneously signed by a number of nations in Moscow, Washington and London.

As outlined in the preamble of the Convention, its conclusion made it necessary to "develop effective international laws and procedures with regard to responsibility for damage caused by space objects and, in particular, providing prompt payment (on the basis of propositions of this Convention) of complete and just compensation to the victims of this damage." In the preamble it is also noted that "establishment of these rules and procedures will promote strengthening of international cooperation in the field of exploration and use of outer space for peaceful purposes."

The Convention defines such essential concepts for the establishment of responsibility as "damage," "launch," "launching nation" and "space object" (Article I).

Also directly related to the questions we have discussed are several Articles (in particular, Articles III and VI) whose titles or text do not contain special mention of the Moon and other celestial bodies.

Article III of the Convention proclaims that "if anywhere except the surface of the Earth a space object of one launching nation or personnel or property on board this space object are damaged by a space object of another launching nation, then the latter bears the responsibility only if the damage is its fault or that of persons for which it is responsible." The meaning of the Article implies that its proposition could be applied to situations arising /87 as the result of activities on the Moon and planets.

According to Article IV of the Convention, if nations launch a space object jointly, they bear joint responsibility. In accordance with Paragraph "c" of Article IV, "if damage is caused to a space object of a third nation or personnel or property on board the space object anywhere except the surface

of the Earth...responsibility to the third nation is determined on the basis of the fault of any of the first two nations or on the basis of the fault of persons for whom any of these two nations is responsible."

The Soviet draft of the lunar Treaty concretes and develops the problem of international responsibility. In accordance with Article XI of the draft, a nation shall bear responsibility for "damage caused by its action or inaction or by the action or inaction of its personnel on the Moon to property or personnel of other nations on the Moon."

This resolution will become especially important in a situation when manned (or even unmanned) scientific stations of different nations will be functioning on the Moon or space equipment belonging to different nations will be "in operation." The new proposition increases the responsibility of states not only for damage caused by its space objects to another state, but also for the action of personnel at a station it has established on the Moon and for damage to property or cosmonauts of another nation also on the Moon.

2. The legal status of the Moon according to the Soviet draft of a lunar treaty

Explorations of the Moon and lunar space began with automatic equipment and stations — the indispensible aids of man. Launches of the Soviet automatic devices in the "Luna" and "Zond" series, as well as the American "Rangers" and "Apollos" past the Moon and onto its surface made it possible to land the first men on the surface of the Earth's only natural satellite.

The importance of this event is enormous. It indeed opens a new stage /88
in the study and use of the Moon. Scales and volume of these investigations will later be ever increasingly expanded and deepened. Undoubtedly, the field of activity of lawyers will also expand because of the close interdependency between scientific-technical achievements and economic , legal and other social relations.

As has already been noted, many cardinal problems concerning the legal regulation of activities of states on the Moon have been solved in general form by the Treaty on principles of activities of nations in the exploration and use of outer space, including the Moon and other celestial bodies. Nevertheless, there remain a few problems which were not and could not be solved by this Treaty and which require additional solution and inclusion in a special international treaty. The Outer Space Treaty at best established minimum basic principles by which states can be guided only in the initial stage of conducting activities on the Moon.

By itself, conclusion of a general international treaty, which the Outer Space Treaty is, did not eliminate the necessity and advisability of further development of its propositions with regard to specific sites of activity. This specific site of activity, the Moon, is better known than other celestial bodies.

As analysis of the Articles of the 1967 Treaty shows, its individual propositions are far from perfect and cannot, because of its general nature, ensure solid law and order which would guarantee conquest of outer space and celestial bodies for peaceful purposes in the interests and for the benefit of all states. In addition, the varied activities of nations on the Moon require additional regulation. Therefore, the main purpose of a special international lunar treaty, along with detailed regulation of various activities there, must be considered providing a solid legal base to guarantee peace and security on Earth and protect the interests of all nations in the tempting and difficult business of conquering the Earth's nearest celestial neighbor.

The government of the Soviet Union was guided by the above as it introduced for consideration of the UN General Assembly in June 1971, its draft of /89
an international lunar treaty. On 29 November 1971 the General Assembly adopted resolution 2779 (XXVI) in which the UN Committee on Outer Space was asked to discuss development of the draft of the lunar treaty and report its discussion to the XXVII session of the UN General Assembly. The Committee on Outer Space in turn handed over this draft for detailed consideration and

agreement to its Legal Sub-committee, which at the regular session in April, 1972, paragraph by paragraph, discussed the text of the Soviet draft.

Introducing the draft of an international treaty regarding the Moon alone, the Soviet government also took into consideration a number of weighty reasons, primarily that the Moon is the only natural satellite of our planet, located comparatively close to the Earth.

At the current stage only the Moon is being directly explored by men; scientists know quite a bit about it in comparison with other celestial bodies. Obviously, the benefit which states can derive from the exploration and use of the Moon, taking into account its proximity to the Earth, is also especially real.

It seems to us that the conclusion of treaties in relation to other celestial bodies such as Venus and Mars is a matter for the more distant future. When scientists obtain a sufficient amount of information about them and when the possibility of conducting human activities there becomes real, the question of concrete legal regulation of activities on each planet individually can be raised. And then the lunar treaty will be able to serve as a model, all the more as the propositions presented by the USSR in the draft of the lunar treaty in no way contradict the general purpose of the conquest of celestial bodies for the benefit of all mankind and as one of their main purposes they proclaim maintaining and expanding international cooperation in the conquest of space.

We must note that the world community in general regarded the new Soviet initiative with favor. "The Soviet draft," noted the Polish press, "is a new concrete expression of the attitude of the socialistic state regarding the dangerous use of space explorations by imperialism for military purposes...It was dictated by a deep feeling of responsibility for the most essential interests of all nations of the world and, undoubtedly, will find warm support from all peoples of good will " [49]. /90

The Brazilian press pointed out that the Soviet draft of the international treaty "responds to the interests of present and future generations " [50]; the French press frankly admitted it could make no serious objections [51].

Naturally, however, on several questions the draft of the lunar treaty caused certain objections in the Legal Sub-committee of the UN Committee on Outer Space. In particular, an objection was raised in connection with the sphere of operation of the treaty: should the new treaty encompass activities of nations on the Moon alone or also on other celestial bodies, particularly on planets of the solar system? It appears that this problem is not as complicated as it is sometimes represented. Having the Treaty on Outer Space of 1967, which established general principles and standards to regulate the activities of nations in outer space, including the Moon and other celestial bodies, it is logical, going from the general to the particular, to develop propositions and standards specifically concerning activities on the Moon. This in no way means that other celestial bodies are excluded from the sphere of regulation of international space law or that in the future a theoretically new approach will be suggested in relation to activities on Mars or Venus or the development of new standards.

Opponents of the Soviet draft also noted that "many propositions in the draft of the lunar treaty are identical or similar to propositions" of the two already-existing international documents in the area of outer space [52] and, evidently, it does not make sense to conclude a new international agreement concerning the Moon.

However, conclusion of an international treaty, especially for the Moon, /91
which would regulate in detail various aspects of activities of states there, could be considered urgent and timely. This could be done, particularly, "in the name of strengthening law and order in outer space and further development of international space law," as indicated in Article 4 of the Soviet-American Agreement on cooperation, signed in May, 1972.

Speaking in favor of the Soviet draft to the XV Colloquium on Space Law, the Yugoslavian lawyer M. Smirnoff noted that "study of the draft of the lunar treaty by appropriate organs of the UN and non-governmental legal organizations is extremely desirable." [53]. As Smirnoff points out, the new Soviet draft not only takes for a base the main principles of the 1967 Treaty and proceeds from them, but also has the aim of explaining and defining more accurately the text of the Outer Space Treaty in order to avoid various contradictory interpretations (similar, for example, to those expressed in relation to Article IV of the Treaty).

In the letter of the USSR Foreign Affairs Minister, A. A. Gromyko, to the UN General Secretary it was especially noted that the Soviet draft is based on "previously concluded agreements in the area of space." The Soviet draft corresponds strictly to generally-accepted standards of international law, including the UN Charter. Of course, the draft is closely connected with the basic propositions of the Outer Space Treaty of 1967.

At the same time, the draft also contains new propositions, extending beyond the bounds of the 1967 Treaty. They are an important step forward on the path of further progress in the development of space law, specifying in particular the standards regulating activities of nations on the Moon.

Really humane considerations for the care of future man explain the theoretically new proposition contained in Article III of the draft that each state "shall conduct exploration and use of the Moon, taking into account the interests of present and future generations." The only natural satellite of the Earth must be preserved as the province of all mankind. Therefore, Article III of the Soviet draft calls for interested states to strive for cooperation in areas concerning activities on the Moon and in case of necessity to conduct consultations of interested states (Paragraph 3 of Article III). /92

The proposition on taking into consideration the interests of present and future generations will serve as a pledge that during exploitation of the Moon, its predatory and irrational use will be prevented, as well as contamina-

tion or "disturbance of the established balance of the lunar environment" (Article IV of the draft). States which according to the 1967 Treaty have the right of free exploration of the Moon must act in such a way as to "avoid unfavorable changes in the lunar environment and its contamination by the introduction of extralunar substances" (Article IV). In case of necessity, states shall conduct consultations. For proper guarantee of such consultations Article III includes a special proposition on cooperation between states on questions concerning lunar activities.

Let us turn to Article I of the draft. Confirming the standard of the Treaty on Outer Space that activities on the Moon shall be conducted in accordance with international law, including the UN Charter, it introduces the concept of "lunar space." In view of the fact that the Outer Space Treaty considers exploration and use exclusively for peaceful purposes of celestial bodies only and in relation to outer space, which lunar space must also be considered, only the development and placement of objects with nuclear weapons or other kinds of weapons of mass destruction are prohibited; it was felt necessary, in the interests of international peace and security of states, to stipulate this aspect especially. In accordance with generally accepted standards of international law, Paragraph 2 of Article I of the draft forbids use of force of any kind or the threat of force on the Moon as well as other hostile actions or their threat. It is also prohibited to use the Moon to conduct the above noted actions in relation to the Earth or space objects. This proposition supplements and develops corresponding standards of the Outer /93
Space Treaty and guarantees the security of the new sphere of activity. The meaning of Article I of the draft is intensified by Article II.

Having confirmed the standard of the 1967 Treaty on the use of the Moon for peaceful purposes and on the ban on military bases, installations and fortifications, tests of any types of weapons and conduct of military maneuvers there, Article II obliges nations "not to place into orbit around the Moon any objects with nuclear weapons or any other kinds of weapons of mass destruction and also not to establish such weapons on the surface of the Moon or in its depths."

The Soviet draft further specifies freedom of scientific research for states on the Moon (Article V). Activities within the limits of such research shall not create an obstacle to activities conducted on the Moon by other states. In case such obstacles are created or threatened, concerned states shall conduct consultation. Such obstacles might be, for example, the cutting off of a source of water if the way to it lies across a narrow approach where personnel of one station might establish some of their equipment. We can imagine the existence of large, convenient and safe depressions on the Moon which could be used for protection against volcanic eruptions. Access to them, in order to fulfill these Articles, must undoubtedly always remain open.

Article VI of the Soviet draft allows states to create both manned and unmanned stations on the Moon. In development of the principle of freedom of scientific research, Paragraph 2 of the Article suggests that states locate stations on the Moon in such a way "that free access of equipment and personnel of other states not be prevented" to all regions of the Moon, in accordance with Article I of the Outer Space Treaty. It can be noted that Article 2 of the Geneva Convention on the high seas of 1958 also obliges states to carry out such freedom "rationally, taking into account the interest of other states in the use of the free open sea " [54].

A great deal of attention in the Soviet draft was given to measures to protect the life and health of a man on the Moon. /94

Article V of the Outer Space Treaty of 1967 regulates matters of rendering aid and rescuing cosmonauts only in general form. The Agreement in 1968 on rescue of cosmonauts, the return of cosmonauts and the return of objects launched into outer space, included in the development of Article V of the Treaty mentions rendering aid to "members of a spacecraft crew". It must be pointed out that the problem of rescue and rendering aid to cosmonauts was given much attention from the very start. We recall that the draft of the Agreement on rescue introduced on the initiative of the Soviet Union for consideration by member nations of the UN was favorably discussed and adopted in a relatively brief length of time for an international document.

Including a corresponding article in its draft of the lunar treaty, the Soviet government considered it necessary to expand the circle of persons to whom aid must be rendered in case of unforeseen circumstances. The problem is that none of these documents indicate the order of rendering aid to personnel on the Moon. The crew of a spacecraft was noted. In the future, personnel of scientific stations will certainly include engineers, scientists, assemblers, laborers and others not formally cosmonauts. Thus, a large category of people who might be on the Moon would remain outside legal regulation.

In accordance with Article VII of the Soviet draft of the lunar treaty, the life and health of any man, irrespective of formal membership in the crew of a spacecraft or of any other such circumstances, are subject to protection and defense. The Article contains a reference to Article V of the Outer Space Treaty as well as to the Agreement on cosmonaut rescue.

Paragraph 2 of Article VII contains an interesting and important innovation: if personnel of one state suffer a disaster, another state is obliged to give them the chance to take shelter in their stations, their equipment, installations or facilities.

Under the severe conditions of our celestial neighbor, when an emergency situation develops this might be the only possible means of saving the people. /95

Being guided by the concept of strengthening international cooperation in the matter of exploration and use of the Moon, according to Article VII, when emergency situations develop states shall with all possible means promote the successful conduct of rescue operations. When lunar stations belonging to different countries are in operation, personnel of neighboring stations shall help and protect each other. The objection of a special consultant of the US Senate Commission on Aeronautics and Space, E. Galloway, against Article VII can almost be interpreted as a curiosity. She feels that the Article does not guarantee aid to women as, she says, it speaks only of men [55].

Besides the humane purposes of rendering aid to personnel of stations suffering disasters, Article VII specifies the duty of all States parties to undertake "necessary measures for the exchange of information" on phenomena which could threaten the life and health of people on the Moon. Neither are the interests of science forgotten. States shall also report any "signs of any kind of organic life" to each other (Paragraph 3 of Article VII). Article XI of the Outer Space Treaty regarding the obligation to inform the UN General Secretary, the public and the international scientific community about the nature, course, locations and results of space activities cannot be considered adequate.

Article X of the Soviet draft is also permeated with the spirit of cooperation and understanding of dangers which might develop unexpectedly on the Moon. In accordance with this Article, a state which finds that an emergency, forced or other unpremeditated landing of a space object not belonging to it has occurred on the Moon must notify the state to whom the object belongs as well as the General Secretary of the UN.

The order of releasing information on national space experiments in the exploration of the Moon was discussed in detail during consideration of the Soviet draft at sessions of the Legal Sub-committee of the Committee on Outer Space. In essence the question was: should the new treaty require mandatory /96
preliminary notification by states about their intent to direct an expedition to the Moon.

What is the basis for solution of this question? The starting point, undoubtedly, should be the Outer Space Treaty, Article XI of which in general form resolves the matter of informing states and the international community about space activities. This Article discusses the obligation to inform "in the maximum possible and practically feasible degree" the General Secretary of the UN, the public and the international scientific community "of the nature, course, locations and results" of its activities. In addition to these propositions, Article VII of the Soviet draft of the lunar treaty specifies the duty to exchange information on established "phenomena which could present a danger

to the life or health of persons on the Moon."

It seems that both Articles could provide complete resolution of the problems facing the establishment of information, primarily that of creating maximum security conditions for people during space experiments. Here, special importance must be given to information which one state could have available regarding unforeseen circumstances able to threaten the safety of people. It is desirable later to obtain all necessary information of a scientific nature and then, when there is genuine international cooperation between states in space activity, to create conditions to help avoid duplication in space experiments. All this is attainable with fulfillment of the obligations contained in these Articles of the 1967 Treaty with the additions suggested by the Soviet draft of the lunar treaty.

Obligations of states to report imminent measures in advance could ultimately be viewed as an attempt to interfere in the internal affairs of a state. The organization and preparation of an experiment and the launch of a space object is the business of the sovereign state itself. This flows from the Treaty on Outer Space as well as standards of general international law. Hence, release of information by a state regarding its internal affairs can only be voluntary. Side interference would only make the conduct of space research more difficult. With an imminent experiment there is always the possibility, for example, of the need to change launch times, launch or landing sites or even the nature of the experiment itself. /97

The creation of a legal standard on mandatory preliminary information about an imminent Moon launch would presuppose the right of other states to conduct preliminary consultations or express protests against a planned experiment. Otherwise the proposition on preliminary information would have no legal meaning. However, acknowledgment of such a right could become a hinderance for scientific and technical progress: it would limit the possibilities for obtaining scientific information.

The Bulgarian delegation made its contribution to solution of this problem during the course of the XII session of the Legal Sub-committee (March 1973), suggesting that the lunar treaty include an Article regarding information on activities connected with exploration of the Moon. This Article would, evidently, satisfy the interests of any state concerned with the progress of scientific research of an exclusively peaceful scientific character and with providing safety conditions for cosmonauts and personnel carrying out activities on the Moon. In it is stated: "States parties shall inform to the maximum possible and practically feasible degree, the General Secretary as well as the public and the international scientific community about their activities connected with the exploration and use of the Moon. Information on time, purposes, sites, parameters of the orbit and duration shall be presented with regard to each lunar expedition as soon as possible after launch, while information on the results of each expedition, including scientific results, shall be presented upon completion of the expedition. In case an expedition lasts more than 60 days information on the course of this expedition shall be presented periodically every 30 days. In relation to expeditions lasting longer than 6 months, only essentially important additions to this information need be reported " [56].

Also directly related to questions of rendering aid to cosmonauts on the Moon are the Soviet-American negotiations on cooperation in the standardization of space equipment and devices which will greatly increase the safety of man's flights in space. /98

Now we come to the problem which many authors feel is the most important — the problem of sovereignty, possession and property on the Moon.

Article II of the Treaty on Outer Space of 1967 prohibits national appropriation of the Moon and other celestial bodies by claim of sovereignty over them or any other means. Expanding and concreting Article II of the Outer Space Treaty, Article VIII of the Soviet draft of the lunar treaty more accurately states that the "surface and depths of the Moon cannot be the property of states, international inter-governmental and non-governmental organizations,

both enjoying the rights of legal persons or not, as well as the property of physical persons." Such scrupulous enumeration of persons who could potentially claim property rights on the Moon,in our opinion, is completely justified. The matter can be especially acute when natural resources begin to be developed on the Moon or in its depths. The intentions of large capitalistic monopolies in relation to the future use of the Earth's only natural satellite are so well known that they need not be noted.

In Article VIII it is especially pointed out that disposition on the Moon of "devices or equipment, including the construction of installations inseparably connected with the surface or with the depths of the Moon," in other words, the installation of stations on the Moon "does not create a proprietary right over sections of the surface or depths of the Moon." Later in the Article are enumerated in detail the legal acts whose object cannot be lunar sections or its depth, namely — concession, exchange, sale and purchase, leasing, renting, donation or any other agreement or contract, with or without exchange of money, between states and the above-listed organizations or persons. These propositions are of no little importance. Article VIII of the Soviet draft should finally remove the foundation from various egoistical plans contradicting the idea of international cooperation of states in the conquest /99 of celestial bodies.

Let us note in passing that exchanging samples of lunar soil returned to Earth between scientists of the USSR and the USA in accordance with the Soviet-American agreement of 21 January 1972 does not contradict Article VIII. The exchange of samples of lunar rock between scientific laboratories of different countries has enormous scientific value and cannot have anything in common with acquisition of sections of the Moon or its depths. [57].

Article IX of the draft defined more accurately and confirmed that in conformity with Article VIII of the Outer Space Treaty,proprietary rights are maintained over "property, including installations, devices and equipment" by the state owning them and delivering them to the surface of the Moon or lunar space.

In connection with the above it is necessary to dwell on the problem of using the concept "common heritage" which arose in the course of discussions in recent sessions of the Legal Sub-committee of the UN Committee on Outer Space.

An interpretation of the Soviet position was given in the Working Paper presented to the Legal Sub-committee on 28 March 1973. [58]/ This concept is validly assigned here to the category of civil constructions.

According to Article I of the Outer Space Treaty of 1967, exploration and use of celestial bodies is the "province of all mankind" and not a "common heritage," inseparably linked with proprietary rights, ownership of a thing and its disposition. The Outer Space Treaty clearly and definitely established that the Moon and other celestial bodies are not subject to national appropriation. From that naturally follows the conclusion that neither the Moon or its depths can become any kind of property. Article VIII of the Soviet draft, as we have stated, directly indicated that the surface of the Moon or its depths cannot be any kind of property. And if, as specified in the draft, they can not become the object of civil or legal transactions: concessions, sales and purchases, etc., then neither can they become the object of inheritance.

As emphasized in the Soviet Working Paper, celestial bodies "are in complete and common use of all nations of the Earth, but not in their joint possession." /100

Regarding the question of extending the concept "common heritage" to natural resources of the Moon, as some lawyers suggest, great discretion will be required in its solution. Activities on our satellite still do not exceed the bounds of scientific research; man is still not really able to exploit natural resources on the Moon. And lack of necessary practice leaves the solution to the problem on an abstract level.

Also unjustified in our opinion are attempts to draw direct analogies with legal problems concerning resources on the sea floor. Although they have a

number of similar aspects, as already indicated, natural resources of the Moon and the sea floor have their own characteristics and require special approaches. This was indicated by the Italian representative at the session of the Legal Sub-committee in March-April 1973 [59].

Evidently, specific solution of the problem of the legal status of natural resources of the Moon, like their actual exploitation, is still ahead.

Article X of the draft considers cases of emergency, forced or other unpremeditated landing of a space object on the Moon. A state, detecting the fact of such a landing, must inform the state to which the space object or its components belong, as well as the General Secretary of the UN.

It must be noted that Article 5 of the Agreement on cosmonaut rescue obliges a state discovering a space object anywhere "not under the jurisdiction of any state" to inform launching authorities and the General Secretary of the UN. It seems, however, that the draft more specifically and accurately regulates a situation connected with detection on the Moon of a space object or its components.

As already indicated, on 29 March 1972, according to the recommendation of the XXVI session of the General Assembly, states signed the Convention on responsibility for damage caused by space objects on which the UN Committee on /101
Outer Space and its Legal Sub-committee had worked for so many years. Together with Article VII of the Treaty on Outer Space, the new Convention regulates complicated problems concerning the responsibility of nations for damage resulting from space activities. Its application to celestial bodies is limited, however, as we have written, to damage caused by space objects, persons or property on board such an object.

Defining the problem of responsibility for damage caused under lunar conditions, the Soviet draft specifies a theoretically new proposition which states that a nation bears responsibility "for damage caused by its action or inaction, or the action or inaction of its personnel on the Moon to property

or personnel of other states on the Moon" (Article XI). In other words, according to the Soviet draft responsibility for damage is borne by the state causing the damage. Undoubtedly, such responsibility for damage resulting from activities on the Moon must also be borne by states in case this activity is conducted by governmental or non-governmental legal persons.

The other Articles of the Soviet draft are final propositions, composed in the spirit of previously adopted international documents. Article XII opens to all states the possibility of joining the Treaty at any time and suggesting corrections.

We have discussed the basic propositions of the Soviet draft of an international lunar treaty, in complete accordance with generally accepted standards of international law, the UN Charter and operative standards of space law.

The XI session of the Legal Sub-committee commissioned by the UN Committee on Outer Space considered the Soviet draft in April 1972. In the course of discussion, conducted in the spirit of cooperation and mutual understanding, a number of states, in particular the USA, Great Britain, France, Sweden and Belgium, presented their suggestions and additions. As the result of broad and comprehensive discussion the majority of the Articles and the preamble of the Treaty were agreed upon. Together with the adopted additions, the draft was again discussed at the XII session of the Legal Sub-committee in March-April 1973, as well as at the regular session of the Committee in June-July 1973. Although some problems remain unresolved, it can be expected that they will also be successfully agreed upon and receive approval of the UN General Assembly. /102

The Polish representative to the recent session of the Sub-committee noted: "Taking into account the rapid progress of technology, it is necessary in the shortest possible order to develop international documents regulating all legal aspects of the use of outer space. Problems which remain unresolved are not insurmountable if we take into account the general atmosphere of cooperation and the spirit of compromise which all delegations display..." [60].

The discussion in the Legal Sub-committee as well as the reaction of the international community have shown the timeliness of the usual Soviet initiative. The majority of states approved the Soviet suggestion to conclude an international lunar treaty.

The Soviet Union and other countries of socialistic cooperation attach a great deal of importance to this document. Acceptance of it would make it possible to avert the threat of spreading the nuclear arms race to the Moon and the use of the Earth's only natural satellite for military purposes.

Conclusion of an international lunar treaty would foster further development of international law standards concerning future activities of states in the conquest of Venus, Mars, Jupiter and other planets in the solar system. This practical step would be a contribution to the formation and development of progressive standards of international space law.

Realistic and well thought out propositions of the Soviet draft will guarantee prevention of political and legal conflicts between states which could seriously disturb the expansion of scientific exploration and use of the Moon in the interests of peace and progress. These purposes will be ensured by propositions of the Articles of the draft which once more emphasize the need for the broadest international cooperation of states in the conquest of Space.

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Chapter III

INTERNATIONAL COOPERATION — A CONDITION OF SUCCESSFUL CONQUEST OF CELESTIAL BODIES

Scientific and technical cooperation between nations has now become one /103
of the most important features of modern international relations. With the advance in scientific and technical achievements this cooperation takes on an increasingly pronounced character.

The development of scientific and technical cooperation is helping build a solid base of peaceful coexistence between states with different political and social structure. Divided by theoretical and ideological contradictions and differences in socio-economic processes of social development, countries with different social systems can establish scientific-technical relations and economic cooperation. This must be based on principles of peaceful coexistence between nations with different structures, their mutual respect and mutual benefit.

As G. I. Tunkin has written, "The principle of peaceful coexistence includes the obligation to develop economical and cultural cooperation between nations on the basis of complete equality and mutual benefit, irrespective of their social systems " [1].

The study and conquest of outer space and celestial bodies have presented nations with inexhaustible possibilities for productive cooperation and peaceful competition. In addition, close contacts and cooperation between many states carrying on space activities are extremely necessary in view of the great cost of space research. No one state can by its own forces alone, in /104
isolation, conduct the entire complicated group of space investigations. At

the same time, effective international cooperation between all countries of the world has enormous advantages. First of all, it will help accelerate the conquest of outer space and celestial bodies, help avoid duplication of research efforts and economize finances and the labor of scientists.

By international cooperation in the area of the conquest and use of outer space must be understood the entire accumulation of legal, economic, scientific and scientific-technical forces of nations, directed toward protecting the interests and welfare of all mankind exclusively for peaceful purposes. Differences in the social structure and economic development of nations must not prevent this cooperation in the conquest of space for the purposes of peace and progress.

Fairly organized, international cooperation between nations should seriously further the progress of cosmic science. For the Moon and other celestial bodies, in particular, when their practical "habitation" begins, maximum support of each other and the rendering of mutual assistance will be extremely necessary.

Successful exploration and use of the Moon, Mars, Venus and other celestial bodies without broad international cooperation would, in general, be extremely difficult. In turn, joint activities in space, on the Moon and other celestial bodies will, undoubtedly, strengthen and improve mutual understanding and mutual relations between peoples on earth.

In order to further the development of broad international cooperation in the conquest of outer space, nations must actively exchange corresponding information. It will not only ensure maximum economy of means but also make possible new achievements in space activities. An encouraging example is the cooperation between Soviet and American scientists, as well as those of other countries, at scientific-research stations in Antarctica, which was entirely possible and what is more, very productive.

From the very first stages of the exploration of outer space and celestial bodies, the Soviet Union was determined to expand international scientific cooperation leading to subsequent realization of the principle of exploration and use of outer space for peaceful purposes. The proposition on the exclusively peaceful conquest of outer space and celestial bodies is the main point of international cooperation between socialistic states in carrying out this kind of activity. /105

As was noted in the draft of the resolution banning the use of outer space for military purposes, introduced by the USSR for consideration of the XIII session of the UN General Assembly in 1958, the Soviet Union in its space investigations is striving to "place scientific and technical achievements at the service of the peaceful needs of man and provide conditions for cooperation between all nations in the investigation of outer space exclusively for peaceful purposes " [2].

At the same time, in 1958 the USSR initiated the conclusion of a multilateral international agreement on cooperation in the field of exploration and peaceful use of outer space. The Soviet government felt that conclusion of this agreement would improve the international situation and provide favorable conditions for regulating many unsolved matters, primarily those of disarmament. Speaking at the First Committee of the General Assembly 12 November 1958 [3], the Soviet representative showed convincingly that the projected program of measures, taking into account the interests of safety of the parties, was equally advantageous to all peoples and states.

As is known, Western powers at that time refused to support the peaceful initiative of the Soviet Union. Since then the Soviet government has pressed for international law regulation of problems standing in the way of space exploration. As a result of this policy, a number of UN decisions have been adopted directed toward the establishment of broad international cooperation. The UN General Assembly, with the direct participation of the Soviet Union and other socialistic countries, has adopted a number of important international resolutions establishing the base for legal regulation of the new sphere of /106

activity. Resolution 1721 (XVI) of the UN General Assembly of 20 December 1961 is known as: "International cooperation in the matter of peaceful exploration of outer space." The feeling of international cooperation between nations in the conquest of outer space also penetrated other resolutions of the UN General Assembly, primarily the solemn Declaration of legal principles of activities of states in the exploration and use of outer space.

At the International conference of the United Nations on the exploration and use of outer space for peaceful purposes in August 1968 (Vienna) the study of possible development of international cooperation in the exploration and use of outer space was given a great deal of attention. A special place was occupied by a discussion of prospects for the use of advances in space research by developing nations, as well as improving weather predictions and use of satellite communications to link continents and draw together peoples of the entire world. The realization of possibilities connected with the conquest of space will, undoubtedly, be a significant contribution to the economic and social progress of mankind, to the strengthening of bonds between nations.

Of special importance is the problem of education by satellite, the realization of which could play an important role in ensuring active international cooperation. In the opinion of experts, the transmission of educational television programs by communications satellites would be a great help in increasing the level of general education of the population of highly inaccesible regions of the vast expanses of Asia, Africa and South America.

In 1967 in the UN Committee on Outer Space the representative of Poland suggested the creation of an international program in the field of education and training [4]. The Polish suggestion noted that lack of enough qualified /107
personnel is the basic factor preventing many countries from participating in explorations of outer space and celestial bodies.

A great deal of attention was given to the problems of education by television through satellites by the XVIII Congress of the International Astronautical Federation held in Belgrade in the autumn of 1967. Here it was noted

that solution of the problem of education by satellite would mean important progress in this field. Educational programs which could be broadcast to all countries of the world by television satellite, and possibly in the future also through stations located on a celestial body, could encompass "almost the entire sphere of human knowledge — from advice on elementary agricultural matters and health care to courses in higher mathematics and physics " [5]./

Very important for solving the problem of education by satellite is the new initiative of the Soviet representative who introduced a suggestion to discuss the question: "On the development of an international convention on principles of use by states of artificial earth satellites for direct television broadcasts" at the XXVII session of the UN General Assembly. Direct television broadcasts (DTB) would promote friendship between peoples of the world, expand the exchange of cultural values, raise the educational level of peoples and ultimately strengthen mutual understanding and friendly relations between nations. But DTB at the same time create serious legal problems connected with the need to guarantee conditions in which this new scientific-technical achievement will serve to strengthen peace and friendship between peoples. The propositions of the Soviet draft of an international convention on DTB, presented by the Soviet Union on 8 August 1972 [6], were formulated with consideration of these requirements.

The Soviet Union supports the use of various legal forms to organize /108
borad international cooperation. These could be bilateral or multilateral agreements, both intergovernmental and interdepartmental [7]./

Various forms of cooperation are used in expanding the links between the Soviet Union and other socialistic countries. Combining the forces of socialistic countries in the exploration of outer space and use of artificial satellites are extremely important to accelerate scientific and technical progress and expand the sphere of international cooperation in the practical conquest of space.

In November 1965, a meeting of socialistic countries (the USSR, Bulgaria, Hungary, the German Democratic Republic, Cuba, Mongolia, Poland, Romania and Czechoslovakia) was held in Moscow on the question of cooperation in the exploration and use of outer space. Participants in the conference exchanged ideas on the best forms and directions for cooperation in the field of peaceful conquest of space, taking into account scientific and technical possibilities and resources of individual socialistic countries. Among many extremely important questions (from the practical point of view) discussed were possibilities for the joint creation and launch of satellites, joint development of instruments and equipment for space research by specialists of various countries, etc.

A conference of experts from socialistic countries was conducted in Moscow on 5-13 April 1967 to discuss cooperation in the exploration and use of outer space for peaceful purposes. The conference worked out protocol (agreements) on individual subjects and experiments concerning the investigation of the physical properties of outer space, space meteorology, space biology and medicine and mapped out a program of joint satellite and rocket launches.

In the interests of further development of cooperation between socialistic countries in the exploration of space, the conference recommended the creation of an international system of communications satellites to transmit various information. It was noted that the system will be open for membership to any state expressing the desire. /109

In the course of conducting this program, called "Interkosmos," after only two and a half years the first satellite of socialistic countries was launched. Equipment developed and produced by scientists and workers of the family of fraternal nations was installed in the satellite.

On 15 November 1970, in Moscow, representatives of Bulgaria, Hungary, the German Democratic Republic, Cuba, Mongolia, Poland, Romania, the Soviet Union and Czechoslovakia signed an agreement to create an international organization and space communications system "Intersputnik." [8]. This organization is

open for membership to any nation and anticipates a large complex of joint efforts.

An international seminar of scientists and specialists of socialistic countries was conducted in January, 1970, in Moscow to deal with the joint analysis of scientific information obtained from space instruments launched in the program of cooperation between socialistic countries. In view of the expanded scales of joint activities, scientific organizations are flooded with a mass of information to be analyzed. Discussed at the seminar were the optimum organization of work in this area and the order of further cooperation and improvement of information about complicated scientific experiments.

Cooperation between socialistic countries in space research, both on the national level and along the line of contacts between scientists, is extremely effective. Scientific data obtained as the result of experiments are widely published in special literature and become the property of the scientific community; press conferences are held concerning results of the experiments, etc. Next, problems of the joint practical investigation of the Moon and planets. The possibilities for cooperation in this area are unlimited.

An example of productive international cooperation on a bilateral basis between states with different socio-political structures is the joint effort /110
in the exploration of outer space conducted by the USSR and France. In June, 1966, the Agreement on cooperation in the study and conquest of outer space for peaceful purposes was concluded between the governments of these countries. Both parties to the agreement pledged to support and assist concerned organizations in the preparation and realization of a program of scientific and technical cooperation in the study and peaceful conquest of outer space. In the preamble of the Agreement it was pointed out that cooperation between the USSR and France in the field of space is an important step in establishing European scientific and technical cooperation.

Since 1966, in accordance with the agreement, a number of successful joint measures have been undertaken. In early 1969 joint rocket sounding experiments of the upper atmosphere over Hayes Island, Franz Josef Land, were conducted where the Soviet observatory "Druzhnaya" is located. French equipment was installed in Soviet meteorological rockets. In February 1969 similar experiments were conducted at the French proving ground in Languedoc. French and Soviet scientists took part in both experiments [9].

The specific spheres of cooperation (space meteorology, space communications, Soviet launch of a French satellite, etc.) in the Agreement included no joint plans for flights to the Moon and planets, their joint investigation or conquest. However, the Agreement opens extensive possibilities for this. In Article 3 of the Agreement it is stated that "in the future other areas of cooperation can be determined upon mutual arrangement" [10].

A shining illustration of cooperation between the two countries was sending a French reflector to the lunar surface in November 1970 with the Soviet automatic station "Luna-17." The experiment was prepared jointly by /111
Soviet and French specialists. In accordance with the Agreement on cooperation, France developed and produced a reflector for laser radar of the Moon and Soviet specialists installed it in the lunar station, and provided dust-proofing and orientation toward the Earth. A joint experiment was conducted to investigate radio-frequency radiation of the sun, using the French "Stereo" device installed in the "Mars-3" Soviet interplanetary station.

At the present time, new joint research is being prepared which will mutually enrich the space programs of both countries. These studies will help strengthen friendly relations and serve as a model of good relations between states with different political structures. At the IX Soviet-French conference on cooperation, held in 1972 at Tbilisi, work continued on joint measures concerning the study and conquest of outer space for peaceful purposes. In particular, further development of the Hayes Island studies is specified for 1973-1974. Suggested were the launching of Soviet MR-12 rockets with measuring equipment of Soviet and French manufacture, the use

of French ground lasers for research purposes, etc. [11].

In October 1973 the regular meeting of USSR and French scientists and specialists was held in the French city of Ajaccio (Corsica). The communique of the meeting summarized the development of cooperation in the exploration and use of space for peaceful purposes, in particular, in the field of space meteorology, space communications, space biology and medicine [12].

The two leading space powers — the Soviet Union and the USA — are cooperating successfully in the field of space research.

Soviet-American cooperation began in 1962 when representatives of both governments exchanged messages proposing a wide program of international scientific cooperation in the conquest of space for peaceful purposes. On 8 June 1962 a bilateral agreement was concluded outlining three directions of space activities: the use of artificial Earth satellites for meteorological purposes, for compiling a magnetic map of the Earth and for the organization of space communication [13]. /112

The Soviet-American agreement differs in its legal nature from that between the USSR and France, as it was not concluded between governments but between the USSR Academy of Sciences the the US National Aeronautics and Space Administration (NASA).

In October 1965 the agreement was supplemented by a new agreement on the preparation and creation of a joint effort in space biology and medicine [14].

During 1970-1971 Soviet and American specialists discussed the possibilities of establishing new contacts for expanding bilateral cooperation in the most varied aspects of space research. In January 1971 during the course of negotiations, representatives of the USSR Academy of Sciences and NASA agreed to exchange lunar soil samples obtained by each country from different parts of the Moon for comparative analysis. In June 1971 during regular negotiations in Moscow, Soviet and American delegations exchanged samples of lunar rock.

Especially important for cooperation was the signing of the Soviet-American Agreement on cooperation in the exploration and use of outer space for peaceful purposes [15]./ This Agreement establishes a solid legal base for further development of links between the two countries.

In accordance with the Agreement, in addition to a study of problems of space meteorology and the natural environment, studies of near space, space biology and medicine, and joint investigation and exploration of the Moon and planets will also be conducted. Concerned with the need to increase the safety of human flights into space, the parties also agreed to conduct ex- /113
periments enabling Soviet and American spacecraft and stations to dock. In 1975 the first joint experiment is planned to dock manned spacecraft and exchange cosmonauts.

In recent years conferences and meetings have been conducted in Moscow, New York and Houston where coordinated technical requirements were worked out for joint docking systems of future spacecraft and stations and possible joint experiments were planned as part of the program of cooperation between the two countries. The Soviet-American Agreement will make it possible for space to become an arena of broad international cooperation.

Joint docking systems in spacecraft and standard docking units will open enormous possibilities for the realization of the most daring space projects to be undertaken by the Soviet Union and the US. In particular, these countries could pool their resources to explore Jupiter or more remote planets with the use of automatic equipment or set themselves a more grandiose goal — a joint expedition to Mars or Venus.

At the regular Soviet-American conference held in Moscow on 9-10 October 1972 at the Institute of Space Research, USSR Academy of Sciences, specific technical problems were discussed connected with the practical realization of the docking project and joint experimental space flights of the American "Apollo" and the Soviet "Soyuz" spacecraft [16]./ Taking part in the conference were Soviet cosmonaut A.S. Yeliseyev and American astronaut Thomas

P. Stafford. A number of questions were resolved at the conference; in particular, the pressure in the spacecraft during docking was agreed on, the actions of the crews during transfer were discussed, acceptable launch times and ballistic circuits were accurately defined, etc. Soviet specialists demonstrated a model of a docking unit developed in the USSR.

The regular Soviet-American meeting of scientists, specialists and cosmonauts (astronauts) was conducted in Houston (USA) in June 1973 [17]. Several more meetings were suggested for next year in order to meet the requirements more fully and define several technical details more accurately. /114

The Soviet Union is also continuing to develop bilateral cooperation with other countries, including those of Asia and Africa. Nations are thereby becoming involved in space research which by their level of economic development are still unable to conduct independent investigations in this area.

In particular, cooperation in the exploration of space is being actively developed between the Soviet Union and India. For several years now, joint efforts have been carried out in atmospheric sounding using Soviet meteorological rockets at the Indian international equatorial proving ground. These are under the general guidance of the United Nations. An Agreement on cooperation in the conquest of space was signed in May 1972 between the two countries which stipulated a number of joint space experiments, in particular, the launch of an Indian artificial Earth satellite with the aid of a Soviet launch vehicle [18]. A group of Soviet scientific workers was sent to India to take an active part in the joint experiments. Soviet scientists are helping India to train its own corps of national specialists.

Bilateral cooperation between the Soviet state and other countries is an example of effective cooperation carried out in strict accordance with standards of international space law.

A different attitude is often expressed with regard to bilateral agreements between capitalistic countries (the USA and England, France, West Ger-

many, countries of Latin America). Certain circles in the US feel one criterion of acceptability of bilateral cooperation is the necessity that an agreement conform to American space programs and another that such agreements /115
offer significant contributions to these programs [19].

It is difficult to imagine how two nations, guided by such criteria, would establish equitable, independent and mutually beneficial cooperation.

In the course of preparing the International telecommunications satellite system (INTELSAT), serious contradictions were found between the USA and other parties to the agreement; with good reason-these showed that the United States wanted to ensure for itself complete control of the activities of INTELSAT. As a result, the US was forced to make several concessions; however, according to the agreement, they control 40% of the votes in the new international organization.

The US also places itself in such advantageous positions in relation to foreign specialists in space science and technology who come to the United States for education and advanced training: the trainees remain in American laboratories until they are no longer of practical use.

At the current level of space activity there are still no joint programs, let us say, no program to explore the Moon or create on its surface a scientific base or colony by the combined forces of several states. Such programs are a matter for the future. There is, however, an international treaty in which the proposition on international cooperation between states occupies a central position and is valued as a condition of progress in the field of exploration and use of outer space, the Moon and other celestial bodies.

International cooperation between states in space explorations will, undoubtedly, be developed and expanded in the next few years. An ever increasing number of states will take an active part in this sphere of activity. Today it is typical for states, without regard for differences in political ideologies, to want to take part in agreements to cooperate for the

for the achievement of common goals in the exploration of outer space. And /116
although bilateral cooperation is playing an important role in the exploration of space and will continue to do so, it is necessary to develop cooperation on a multilateral base, where the greatest possibilities are opened for nations to take part in joint programs and international organizations. Results of international cooperation in the exploration and use of space, the Moon and planets can be of use to all mankind, and not only our contemporaries, but also future generations.

In the preamble of the Outer Space Treaty it is proclaimed that its conclusion should "unite international cooperation in the peaceful exploration and use of outer space." In complete accordance with the Treaty, a great contribution to strengthening international cooperation is made by the Agreement on cosmonaut rescue of 1968 and other international documents in this area. The Soviet draft of a lunar treaty also suggests the broadest cooperation between states in carrying out activities on the Moon.

International cooperation, genuine not in words but in fact, between states in the area of space activity is an important and indispensible condition of further progress.

Disclosing the secrets of the Moon and other celestial bodies, their development and future use — this is the dream of all mankind. But this also means that its realization requires joint forces of all nations for the good of all mankind.

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CONCLUSION

More than 15 years have passed since the first Soviet artificial Earth satellite was launched in the USSR [1]. Planned scientific investigation and exploration of the Moon began in January,1959. Since then the development of astronautics has traversed a grand and difficult path. Many Soviet and American cosmonauts and astronauts have followed Yu. A. Gagarin in outer space and there have also been men on the Moon, our closest celestial body; scientific experiments to investigate the basic characteristics of the Earth's natural satellite have been conducted by two Soviet moonships. /117

Significant advances have also been noted in the field of legal regulation of the new sphere of activity. Legal foundations for forthcoming activities on the Moon have been created.

USSR cosmonaut-pilot, Doctor of Technical Sciences K. P. Feoktistov, the first scientist in the world to make a space flight, analyzing the importance of the launch of the first Earth satellite for the future development of astronautics, noted that "Sputnik forced mankind to grow up...Because of space exploration people began to see our planet more clearly as a common home, often beautiful, but not really as big as it seems, where all are obliged to live according to the laws of honesty, peace and mutual respect. And I speak of maturity because, in our century with its weapons of mass destruction, wars seem to be a barbarous and savage puerile stupidity which can be unleashed only by criminally irresponsible people " [2]. /118

In these words the Soviet cosmonaut-scientist focuses attention on the responsibility borne by mankind, embarked on a path of penetrating beyond the limits of his own planet. These words are also meant as a warning to those who invest the great enterprise of the conquest of the Universe with a content other than ideals of peace, honesty and mutual respect.

Of special importance are the enormous successes of the Soviet state in economical, scientific-technical and cultural areas. During the years of its existence, the Soviet Union has made an invaluable contribution to the protection of peace and the strengthening of friendship between peoples.

The President of the USSR Academy of Sciences, M. V. Keldysh, speaking at the XXIV Congress of the Communist Party of the Soviet Union, noted that "our country, paving the way into space, has achieved...outstanding successes in the creation of orbital stations and the exploration of the Moon and planets " [3]. The Soviet state is guided by ideas of peace and scientific knowledge in its conduct of space activities and, therefore, attaches great importance to the organization and consolidation of forces and means of various countries in carrying out space research. International cooperation between nations in the realization of grandiose projects of exploration and use of outer space and celestial bodies is called upon to play a decisive role in the achievement of the great objectives in the conquest of space.

This is why there was such response to the important initiative of the Soviet Union which introduced for consideration of the XXIV session of the UN General Assembly the draft of a resolution "On nonapplication of force in international relations and a permanent ban on the use of nuclear weapons " [4]. Adoption of this proposal would present nations with new prospects for the relaxation of international tension and would greatly help solve the problem of universal disarmament. /119

The Soviet state and other countries of socialistic cooperation are consistently and solidly realizing concrete measures to develop cooperative relations with other nations, including those with different socio-economic systems. As a result, principles of peaceful coexistence between the most varied nations have been introduced into modern international life.

An important contribution to the matter of peace and relaxation of international tension was made by the second summit meeting between Soviet and American leaders in June, 1973. The first meeting, held in Moscow in May, 1972,

laid the foundations for rebuilding relations between the USSR and the USA in accordance with principles of peaceful coexistence. These principles were included in bilateral documents signed during the course of negotiations. The negotiations which took place at the second meeting and the documents signed by Soviet and American statesmen, in the words of the General Secretary of the Communist Party of the Soviet Union, L. I. Brezhnev, gave a "strong new impetus" to further mutually-beneficial development of Soviet-American relations "intended as a "long-term prospect " [5].

Only with the relaxation of international tension and genuine cooperation between nations will successful solution of the grandiose objectives facing mankind in the conquest of space become possible.

Directives of the XXIV Congress of the Communist Party of the Soviet Union concerning the five-year plan and scientific efforts in space for purposes of developing long-distance telephone-telegraph communications, television, meteorological prediction and the study of natural resources, etc., also stipulate continuation of fundamental scientific research of planets in the solar system [6]. Realization of this program will further the development of productive forces and solution of cardinal problems of science and the national economy /120
by new means.

A regular program of peaceful exploration and use of outer space and celestial bodies, conducted by the Soviet Union, is finding support and approval from peaceful and progressive forces of the entire world.

The activities of the USSR in all international organizations, primarily the UN, have a great positive influence on the solution of legal problems which arise during the conquest of space. With direct participation of the representatives of our country, fair principles and standards were developed which are intended to regulate the various aspects of expanding space activities.

A new branch of international law has been founded and is being developed — space law. Despite its "youth," it has to its credit a number of treaties and

agreements, multilateral as well as bilateral.

One difficulty in solving legal problems resulting directly from scientific and technical progress is that standards of traditional international law cannot be automatically applied to the new sphere of activity. A special complication is presented by legal problems arising from the prospect of future activity on the Earth's only natural satellite — the Moon.

From this point of view, the proposal of the Soviet Union to conclude an international treaty especially for the Moon is the first test of international law regulation of problems connected with specific activity beyond the Earth. The activity of nations on the Moon can serve as a good model for further stages in the regulation of problems regarding other celestial bodies: Mars, Venus, Jupiter and other planets.

However, there are still quite a few unsolved problems concerning the space activities of nations. They include the future use of celestial bodies, especially exploitation of their natural resources. Evidently, a special international agreement must be concluded in the future regarding the order of development and use of resources, their distribution among interested parties, control of proper and careful expenditure of the natural resources of the Moon, /121 planets, etc.

At the present time, when samples of lunar soil are being used only for purposes of scientific research, in our opinion, the principles of the Outer Space Treaty which bear a relation to problems of natural resources can still be considered adequate. But preparations must be made to solve these problems or in time this will become a practical impossibility.

These problems are becoming urgent because in some countries, including the USA, there are proponents of "commerce in space." A group of wealthy citizens in Houston, calling themselves the "Committee of the Future" hope to profit from the sale of lunar rock samples, television broadcasts, movies, the

dissemination of photographic materials and writings as well as from fees for conducting scientific experiments. The Committee expects that the US government will put at its disposal without charge rockets and spacecraft left over after completion of the present series of "Apollo" flights to the Moon. It is assumed that NASA will assume operative control over the expedition; unofficial negotiations have already been conducted with appropriate officials. It has become known that several astronauts have expressed readiness to take part in the expedition called "Harvest Moon " [7].

Plans for "commercial expeditions" to the Moon, organized by private business, cannot fail to cause alarm. Space activities, primarily because of considerations for their safety, are incompatible with private enterprise which, as a rule, always goes hand in hand with chaos and tyranny. In any case, enthusiasts of "commercial expeditions" must not forget that according to the Treaty on Outer Space nations bear "international responsibility for national activities in outer space, including the Moon and other celestial bodies," no matter by whom this activity is conducted — governmental agencies or non-governmental private parties. And if the solution of private activity in space research lies within the province of internal competence of the USA, /122 then according to the aims of the Treaty this is a matter of carrying out self-imposed obligations. Realization of such plans could hardly be in complete accord with Articles I, III and IX of the 1967 Treaty.

The literature on space law contains many proposals for further regulation of legal problems flowing from activities on celestial bodies.

W. Jenks, therefore, asks the question of the legal status of objects sent to the Moon and left there, either for symbolic or scientific purposes, or for the use of those going to the Moon later, or because they are, in general, no longer of use to anyone. Jenks feels that it would be worthwhile to prepare an agreement on objects remaining on the Moon» [8].

Serious legal consequences are created by cluttering up outer space with objects of earthly origin. Cosmonauts during flights have already recorded a

large amount of space object debris. In the future this problem will, undoubtedly, make it necessary to adopt a special agreement or other document. States can, perhaps, work out individual instructions or protocols, similar to those in air and sea law, to regulate specific practical matters of activity in outer space and on celestial bodies. To ensure safety of space flights with the ever-increasing amount of movement, instructions could be given prescribing the order and sequence of launch, etc.

As can be seen from this far from complete list of problems which will have to be solved in the interests of the development of space activity by nations, there are many such matters. They require the discussion and working out of special standards and principles. In relation to several aspects of space activity, new treaties and agreements are, undoubtedly, needed. There /123
must be further codification of space law, whose standards will in time regulate numerous aspects of activity of "earth" states in outer space. Mutual relations with inhabitants of other worlds will be regulated by standards of future interplanetary law.

As was correctly noted by W. Jenks, in a few years there will be a whole series of agreements, developing the general principles of the Outer Space Treaty in more specialized form [9].

We have discussed in this work several legal problems arising with the continuing conquest of the Moon and planets as well as those problems which can develop with increased activity there. Continuing experiments will provide an enormous amount of information which it will not be so easy to analyze. Close interrelation between many branches of learning, cooperation of the most varied groups of scientists and genuine international cooperation between all nations are required and only this will ensure successful development of all aspects of peaceful astronautics.

The knowledge obtained must be used for the benefit of all peoples of the Earth in the interests of improving life here and in the interests of a better

future, a future without wars or conflicts. As pointed out by L.I. Brezhnev in a speech to the World Congress of Peaceful Powers, held in Moscow in October 1973, Soviet peoples want a world "open for broad international cooperation." Providing such a world will require "the development of economical, scientific-technical and cultural cooperation on the basis of complete equality of rights and mutual benefit, without any discrimination or attempts to intervene in the internal affairs of one another " [10].

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APPENDIX

Lunar Treaty (Draft)*

States signing this treaty,\

noting the successes achieved by States in the exploration of the Moon,

recognizing that the Moon, being the Earth's only natural satellite, plays an important role in the conquest of space,

not wishing to allow the Moon to be turned into an arena of international conflicts,

firmly resolved to further the future development of cooperation between States in the exploration and use of the Moon, its depths and lunar space,

based on the propositions of the Treaty on principles of activities of States in the exploration and use of outer space, including the Moon and other celestial bodies, and of the Agreement on the rescue of cosmonauts, the return of cosmonauts and the return of objects launched into outer space,

taking into consideration the necessity of concretion and development of propositions of these international documents with regard to the Moon and taking into account further progress in the conquest of outer space,

agree to the following:

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*"Pravda," 9 June 1971.

Article I

1. Treaty members\ shall conduct their activities on the Moon and in lunar space in accordance with international law, including the Charter of the United Nations.

2. In accordance with the principles of the United Nations Charter, the use of force in any form or the threat of force, as well as other hostile actions or their threat shall be prohibited on the Moon. Also banned is the use of the Moon to conduct any of the above-mentioned actions in relation to the Earth or space objects.

Article II /125

1. The Moon shall be used by all Treaty members| exclusively for peaceful purposes.

2. Treaty members\are obliged not to place into orbit around the Moon any objects with nuclear weapons or any other kinds of weapons of mass destruction or establish such weapons on the surface or in the depths of the Moon.

3. Banned on the Moon are the creation of military bases, installations or fortifications, the testing of any type of weapons and the conduct of military maneuvers.

Article III

1. Treaty members\ shall strive for cooperation in matters concerning activities on the Moon. Such cooperation can be on either a multilateral or a bilateral basis.

2. Each Treaty member\shall conduct exploration and use of the Moon with consideration of the interests of present and future generations as well

as observe the rights of other Treaty members\ stipulated by the present Treaty.

3. Treaty members| having reason to believe that another treaty member\ is\ violating its obligation according to the present Treaty can ask for consultations of concerned States parties.

Article IV

1. Treaty members\ shall conduct exploration and use of the Moon judiciously, ensuring no violation of the established lunar environment.

2. Treaty members| shall conduct exploration and use of the Moon in such a way as to avoid unfavorable changes in the lunar environment or its contamination by the introduction of an extralunar substance. In case of necessity consultations shall be conducted between concerned Treaty members.\

Article V

1. Treaty members\ can conduct their activities in the exploration and use of the Moon anywhere on the surface of the Moon, in its depths or in lunar space.

2. For these purposes Treaty members\ can, in particular:

— land their space objects on the Moon, launch them from the Moon and place them in a lunar orbit;

— place their devices, equipment and personnel anywhere on the surface of the Moon, in its depths or in lunar space.

Devices and personnel of Treaty members\ can move freely over the surface of the Moon, in its depths or in lunar space.

3. The actions of Treaty members\ in accordance with propositions of points 1 and 2 of this article must not create an obstacle for activities con- /126

ducted on the Moon by other Treaty members. In case of the possible creation of such obstacles, interested Treaty members shall conduct consultations.

Article VI

1. Treaty members can create both manned and unmanned stations on the Moon.

2. Stations should be located where they do not prevent free access of equipment or personnel of other Treaty members conducting their activities on the Moon to all regions of the Moon, in accordance with Article I of the Treaty on principles of activities of States in the exploration and use of outer space, including the Moon and other celestial bodies.

Article VII

1. Treaty members are obliged to take all possible measures to preserve the life and health of a man on the Moon. For these purposes they shall consider any man on the Moon as a cosmonaut in the sense of Article V of the Treaty on principles of activities of States in the exploration and use of outer space, including the Moon and other celestial bodies, as well as a crew member of a spacecraft in the sense of the Agreement on the rescue of cosmonauts, the return of cosmonauts and the return of objects launched into outer space, irrespective of the length of his stay on the Moon, his location on the Moon, formal membership in the crew of any spacecraft or any other such circumstances.

2. Treaty members are obliged to grant to personnel of another Treaty member suffering a disaster on the Moon the right to take shelter in their stations, their equipment, installations or facilities.

3. Treaty members conducting activities on the Moon shall take necessary measures to exchange information concerning phenomena they have detected in outer space, including the Moon and other celestial bodies, which could present

a danger for the life and health of other persons on the Moon and report signs of any kind of organic life.

Article VIII

1. The surface and depths of the Moon cannot be the property of States, international intergovernmental or nongovernmental organizations, national organizations which have the rights of legal persons or which do not, or the property of physical persons. Placing devices or equipment on the surface or in the depths of the Moon, including the construction of installations, permanently connected to the surface or with the depths of the Moon, does not create proprietary rights to sections of the surface of the Moon or its depths. /127

2. Sections of the surface or depths of the Moon cannot be the object of concession, exchange, transfer, sale and purchase, lease, hire, gift or any other treaties or pacts, with or without the exchange of money, between States, international intergovernmental or nongovernmental organizations or national organizations, either enjoying the rights of legal persons or not, or treaties and pacts between physical persons.

Article IX

In accordance with Article VIII of the Treaty on principles of activities of States in the exploration and use of outer space, including the Moon and other celestial bodies, Treaty members\maintain proprietary rights over their property delivered to the surface of the Moon or to lunar space, including installations, devices and equipment.

Article X

Treaty members| which detect the emergency, forced or other unplanned landing of a space object not belonging to them or the components of any object shall report this to the Treaty member to which this space object or its\ components belong and to the General Secretary of the UN.

Article XI

A Treaty member, in addition to the propositions of Article VII of the Treaty on principles of activities of States in the exploration and use of outer space, including the Moon and other celestial bodies, bears the responsibility for damage due to its action or inaction, or to the action or inaction of its personnel on the Moon, of property on the Moon or personnel of other Treaty members if it is not established that the damage was not the fault of this State or not the fault of its personnel on the Moon.

Article XII

1. The present Treaty shall be open for signature by all States. Any State which does not sign the present Treaty before it comes into force, in accordance with point 3 of this Article, can sign it at any time.

2. The present Treaty is subject to ratification by the signatory States. The ratifications and subscription documents shall be deposited with Governments..., which are named as depositary-Governments.

3. The present Treaty shall come into force upon the deposit of ratifications with Governments, including those named as depositary-Governments of the present Treaty.

4. For States whose ratifications or subscription documents will be deposited after the present Treaty comes into force, it will come into force on the date of deposit of their ratifications or subscription documents. /128

5. Depositary-Governments shall without delay report to all signatory or subscribing States the date of deposit of each ratification and subscription document, the date this Treaty comes into force as well as other notifications.

6. The present Treaty shall be registered by depositary-Governments in accordance with Article 102 of the Charter of the United Nations.

Article XIII

Any Treaty member may propose amendments to this Treaty. Amendments shall come into force for each Treaty member adopting these amendments after their adoption by the majority of Treaty members, later for each other Treaty member on the day it adopts these amendments.

Article XIV

Any Treaty member can report its withdrawal from the Treaty a year after it comes into force by a written notification to depositary-Governments. Such withdrawal shall take effect after the expiration of one year from the day this notification is received.

Article XV

The present Treaty, of which Russian, English, French, Spanish and Chinese texts are equally authentic, shall remain deposited in the archives of depositary-Governments. Duly certified copies of the present Treaty shall be transmitted by depositary-Governments to the Governments of signatory and subscribing States.

In witness of which, the undersigned duly authorized representatives have signed the present Treaty.

Done in . . . . . copies in the cities of . . . . . on the . . . . day of . . . . . one thousand nine hundred and seventy . . . . .